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1889.	*Hunter H. McGuire.	W. O. Roberts. *Bedford Brown.	W. E. B. Davis.	Hardin P. Cochrane.
1890.	George J. Engelmann.	Berthold E. Hadra. Duncan Eve.	W. E. B. Davis.	Hardin P. Cochrane.
1891.	Lewis S. McMurtry.	J. McFadden Gaston. J. T. Wilson.	W. E. B. Davis.	Hardin P. Cochrane.
1892.	J. McFadden Gaston.	Cornelius Kollock. George Ben Johnston.	W. E. B. Davis.	Hardin P. Cochrane.
1893.	*Bedford Brown.	Joseph Price. George A. Baxter.	W. E. B. Davis.	Hardin P. Cochrane.
1894.	*Cornelius Kollock.	A. B. Miles. J. B. S. Holmes.	W. E. B. Davis.	Hardin P. Cochrane.
1895.	Louis McLane Tiffany.	Ernest S. Lewis. Manning Simons.	W. E. B. Davis.	Richard Douglas.
1896.	Ernest S. Lewis.	Joseph Taber Johnson. Richard Douglas.	W. E. B. Davis.	A. M. Cartledge.
1897.	George Ben Johnston.	W. E. Parker. Floyd W. McRae.	W. E. B. Davis.	A. M. Cartledge.
1898.	Richard Douglas.	*H. H. Mudd. James A. Goggans.	W. E. B. Davis.	A. M. Cartledge.
1899.	Joseph Taber Johnson.	F. W. Parham. W. S. Robinson.	W. E. B. Davis.	A. M. Cartledge.
1900.	A. M. Cartledge.	Manning Simons. W. P. Nicolson.	W. E. B. Davis.	W. D. Haggard.
1901.	Manning Simons.	George H. Noble. L. C. Bosher.	W. D. Haggard.	Floyd W. McRae.
1902.	*W. E. B. Davis.	J. Wesley Bovée. J. W. Long.	W. D. Haggard.	Floyd W. McRae.
1903.	J. Wesley Bovée.	Christopher Tompkins. Bacon Saunders.	W. D. Haggard.	Floyd W. McRae.

HONORARY MEMBERS.

1894.—Foy, George,	Dublin.
1902.—Gaston, J. McFadden,	Atlanta, Ga.
1894.—Jacobs, Charles,	Brussels.
1894.—Martin, A.,	Berlin.
1902.—Maury, Richard B.,	Memphis, Tenn.
1894.—Morisani, O.,	Naples.
1894.—Pozzi, S.,	Paris.
1902.—Reamy, Thaddeus A.,	Cincinnati, Ohio.

MEMBERS.

1894.—Baldridge, F. E., M.D. Huntsville, Ala.

1900.—Baldy, John Montgomery, M.D. Professor of Gynecology, Philadelphia Polyclinic; Surgeon to Gynecean Hospital; Gynecologist to Pennsylvania Hospital; Consulting Surgeon to Frederick Douglass Free Hospital. 1831 Chestnut Street, Philadelphia, Pa.

1901.—Baughman, Greer D., M.D. Lecturer on Hygiene; Demonstrator of Pathology; Demonstrator of Physiology; in charge of Gynecological Dispensary at Medical College of Virginia. 12 North Second Street, Richmond, Va.

1890.—Baxter, George A., M.D. Professor of Surgery in the Medical Department of Grant University; ex-President of the Tennessee State Medical Society; Fellow of the American Surgical Association. *Vice-President*, 1893. Chattanooga, Tenn.

1900.—Benedict, Samuel C., M.D. Ex-President of the Medical Association of Georgia; Professor of Medical Jurisprudence, Law School, University of Georgia. 9 East Broad Street, Athens, Ga.

1900.—Black, James Madison, M.D., B.S. Consulting Surgeon Southern Railway. West Church Avenue, Knoxville, Tenn.

1893.—Bloom, J. D., M.D. Surgeon-in-Charge, Charity Hospital; Consulting Surgeon, Touro Infirmary; Lecturer on Diseases of Children, Tulane University. New Orleans, La.

1901.—Boldt, Hermann J., M.D. Gynecologist to Post-Graduate Hospital, St. Mark's Hospital, German Polyclinic; Consulting Gynecologist, Beth Israel Hospital; Professor of Gynecology, Post-Graduate Medical School. 39 East Sixty-first Street, New York, N. Y.

1902.—Bonifield, Charles Lybrand, M.D. Professor of Clinical Gynecology, Medical College of Ohio (Medical Department University of Cincinnati); Member American Association

of Obstetricians and Gynecologists; ex-President Cincinnati Academy of Medicine; ex-President Cincinnati Obstetrical Society. 432 West Fourth Street, Cincinnati, O.

1890.—Bosher, Lewis Crenshaw, M.D. Professor of Surgery in the Medical College of Virginia; Visiting Surgeon to the Old Dominion Hospital; Member of the American Association of Obstetricians and Gynecologists, and Association of American Anatomists. 717 East Franklin Street, Richmond, Va.

1895.—Boveé, J. W., M.D. Gynecologist to Columbia and Providence Hospitals; Clinical Professor, Medical Department of Columbian University; Fellow of American Gynecological Society; Honorary Member, Virginia Medical Society; Member of Washington Obstetrical Society, the American Medical Association, and the Medical and Surgical Society, District of Columbia. 1404 H Street, N. W., Washington, D. C.

1889.—Brokaw, Augustus V. L., M.D. Professor of Anatomy in the Missouri Medical College; Assistant to the Chair of Surgery and Senior Assistant Surgeon, St. John's Hospital. Cor. Washington Boulevard and Taylor Ave., St. Louis, Mo.

1902.—Broome, G. Wiley, M.D. Consulting Surgeon St. Louis City and Female Hospitals; Member St. Louis Medical Society. 407 North Grand Avenue, St. Louis, Mo.

1898.—Brown, George S., M.D. Ex-President Jefferson County Medical Society. Birmingham, Ala.

1897.—Bryson, John P., M.D. Professor of Genito-urinary Surgery, St. Louis Medical College; Surgeon to the St. Louis Mullanphy Hospital. 209 N. Garrison Avenue, St. Louis, Mo.

1899.—Burthe, L., M.D. 124 Baronne Street, New Orleans, La.

1900.—Byford, Henry T., M.D. Professor of Gynecology, College of Physicians and Surgeons (University of Illinois), Chicago; Professor of Clinical Gynecology, Northwestern University Woman's Medical School; Professor of Gynecology, Chicago Post-Graduate Medical School; Professor of Gynecology, Chicago Clinical School; Surgeon to Woman's Hospital; Gynecologist to Chicago West Side Hospital. Reliance Building, 100 State Street, Chicago, Ill.

1902.—Caldwell, C. E., M.D. Professor of Orthopedic Surgery, Miami Medical College; Visiting Orthopedic Surgeon, Cincinnati Hospital; Member Cincinnati Academy of Medicine. 1110 Cross Lane, Cincinnati, O.

1891.—Cartledge, Abiah Morgan, M.D. Professor of Gynecology and Abdominal Surgery, Louisville Medical College; Visiting Surgeon to the Louisville City Hospital; Surgeon to the Louisville Home of the Friendless; ex-President of the Louisville Medico-Chirurgical Hospital. *Treasurer*, 1895–1899; *President*, 1900. 205 West Broadway, Louisville, Ky.

1899.—Cathcart, R. S., M.D. Assistant to Chair of Clinical Surgery in the Medical College of the State of South Carolina. 66 Hasell Street, Charleston, S. C.

1893.—Cocram, Henry S., M.D. 124 Baronne Street, New Orleans, La.

1893.—Coley, Andrew Jackson, M.D. Councillor of the Medical Association of the State of Alabama. Alexander City, Ala.

1902.—Coley, William B., M.D. Clinical Lecturer on Surgery, College of Physicians and Surgeons; Assistant Surgeon in Hospital for Ruptured and Crippled; Attending Surgeon to General Memorial Hospital; Fellow of the American Surgical Association, New York Surgical Society, and New York Academy of Medicine. 5 Park Avenue, New York, N. Y.

Founder.—Copeland, Benjamin G., M.D. Professor of Anatomy and Clinical Surgery, Birmingham Medical College; Professor of Anatomy and Surgery, Birmingham Dental College; Surgeon and Gynecologist, Hillman Hospital. 224 Chalifoux Building, Birmingham, Ala.

1902.—Crile, George W., M.D. Professor of Clinical Surgery, Medical College of Western Reserve University; Surgeon to St. Alexis' Hospital; Surgeon to Lakeside Hospital. 275 Prospect Street, Cleveland, O.

1893.—Crofford, T. J., M.D. Professor of Physiology and Cilinical Lecturer on Gynecology in the Memphis Hospital Medical College. 155 Third Street, Memphis, Tenn.

Founder.—Cunningham, Russell M., M.D. Professor of Practice of Medicine and Clinical Medicine, Birmingham Medical College; Surgeon to the Pratt Mines Hospital. Ensley, Ala.

1894.—Dandridge, Nathaniel Pendleton, M.D. Professor of Surgery, Miami Medical College; Surgeon to Cincinnati Hospital and Episcopal Hospital for Children. 422 Broadway, Cincinnati, Ohio.

Founder.—Davis, John D. S., M.D. Professor of Principles and Practice of Surgery and Clinical Surgery, Birming-

ham Medical College; formerly Gynecologist to Birmingham Hospital of United Charities; formerly Chairman of the Judicial Council of the Alabama Surgical and Gynecological Association; ex-President of the Jefferson County Medical Society and of the Board of Health. 2031 Avenue G, Birmingham, Ala.

Founder.—*Davis, William Elias B., M.D. Professor of Gynecology and Abdominal Surgery, Birmingham Medical College; ex-President of the Tri-State Medical Society of Alabama, Georgia, and Tennessee; Fellow of the American Association of Obstetricians and Gynecologists, and First Vice-President, 1895; President, 1901; formerly Chairman of the Section of Obstetrics and Diseases of Women, and Vice-President of the American Medical Association; Honorary Member of the Medical Society of the State of New York and of the Louisiana State Medical Association; Honorary President of Section on Abdominal Surgery, Pan-American Medical Congress, 1893, and Vice-President of Congress of 1896; Fellow of the British Gynecological Society; formerly Surgeon to the Birmingham Hospital of United Charities. *Secretary,* 1887–1900. *President,* 1902.

1891.—Dean, G. R., M.D. Fellow of the American Association of Obstetricians and Gynecologists; President of South Carolina State Medical Association; ex-President Association of Surgeons of Southern Railroads. Spartanburg, S. C.

1900.—Deaver, John B., M.D. Surgeon-in-Chief to the German Hospital. 1634 Walnut Street, Philadelphia.

1901.—Dibrell, James A., M.D. Dean Medical Department, University of Arkansas. Little Rock, Ark.

1892.—Dixon, Archibald, M.D. Ex-President of the Kentucky State Medical Society; ex-President of the McDowell Medical Society; ex-President of the Mississippi Valley Medical Association. Henderson, Ky.

1897.—Dorset, Walter B., M.D. Professor of Obstetrics and Clinical Gynecology, Marion Sims-Beaumont Hospital Medical College; Gynecologist to the Missouri Baptist Sanitarium and to Evangelical Deaconess' Hospital. 3941 North Belle Place, St. Louis, Mo.

1896.—Doughty, W. H., M.D. Professor of Anatomy and Clinical Surgery, Medical Department, University of Georgia. 822 Greene Street, Augusta, Ga.

* Deceased.

Founder.—Douglas, Richard, M.D. Ex-President of the Tri-State Medical Society of Alabama, Georgia, and Tennessee; Fellow of the British Gynecological Association. *Treasurer*, 1894–1895; *Vice-President*, 1896 *President*, 1898. 110 South Spruce Street, Nashville, Tenn.

1902.—Dudley, A. Palmer, M.D. Professor of Diseases of Women, New York Post-Graduate Hospital and Dartmouth Medical College; Member International Gynecological Society, American Gynecological Society, New York Obstetrical Society, and New York Academy of Medicine. 678 Madison Avenue, New York, N. Y.

1900.—Dunning, Lehman Herbert, M.D. Professor of Diseases of Women, Medical College of Indiana; Consulting Gynecologist to Indianapolis City Hospital and Dispensary. 224 N. Meridian Street, Indianapolis, Ind.

1899.—Earnest, J. G., M.D. Professor of Clinical Gynecology, College of Physicians and Surgeons; formerly Professor of Gynecology, Southern Medical College; Visiting Gynecologist to the Grady Hospital. Atlanta, Ga.

1891.—Elkin, William Simpson, M.D. Professor of Operative and Clinical Surgery, Atlanta College of Physicians and Surgeons; ex-President of the Atlanta Society of Medicine; Surgeon to Grady Hospital. 27 Luckie Street, Atlanta, Ga.

1900.—Ellis, James N., M.D. 19 Forest Avenue, Atlanta, Ga.

1889.—Engelmann, George J., M.D. Master in Obstetrics, Vienna; late Professor of Obstetrics and Diseases of Women, St. Louis Post-Graduate School; formerly Professor of Diseases of Women and Operative Midwifery, Missouri Medical College; President Boston Obstetrical Society, and American Gynecological Society, 1900; late President of the St. Louis Obstetrical and Gynecological Society, the International Congress of Gynecology, 1892 and 1896; Member of the London Obstetrical Society, British Gynecological Society. *President*, 1890; *Council*, 1890–1902. 208 Beacon Street, Boston, Mass.

1898.—Fenner, E. D., M.D. First Assistant Surgeon, Charity Hospital; Lecturer on Diseases of Children, Tulane University of Louisiana. New Orleans, La.

1900.—Ferguson, Alexander Hugh, M.D. Professor of Surgery, Chicago Post-Graduate; Professor of Surgery, Medical Department (College of Physicians and Surgeons), University of Illinois. 10 Drexel Square, Chicago, Ill.

1901.—Fort, R. E., M.D. Formerly Superintendent Nashville Hospital. 1414 Sigler Street, Nashville, Tenn.

1895.—Fortier, S. M., M.D. Visiting Surgeon to Charity Hospital. 4422 St. Charles Avenue, New Orleans, La.

1902.—Freiberg, Albert H., M.D. Professor of Orthopedic Surgery, University of Cincinnati (Medical College of Ohio), and in the Laura Memorial Women's Medical College; Orthopedic Surgeon to the Cincinnati, Presbyterian, and Jewish Hospitals; Fellow of the American Orthopedic Association. 708 Walnut Street, Cincinnati, O.

1895.—Fry, Henry D., M.D. Professor of Obstetrics, Georgetown University. 1601 Connecticut Avenue, N. W., Washington, D. C.

1900.—Gaston, J. McF., Jr., A.M., M.D. President of Alumni Association, Southern Medical College. 421 Capital Avenue, Atlanta, Ga.

1900.—Gerster, Arpad G., M.D. Attending Surgeon to Mt. Sinai Hospital; Consulting Surgeon to the German Hospital. 34 East Seventy-fifth Street, New York, N. Y.

1898.—Gessner, Hermann B., A.M., M.D. Chief of Clinic to Chair of Surgery, Tulane University of Louisiana; Visiting Surgeon, Charity Hospital; Demonstrator of Operative Surgery, Tulane University of Louisiana; Professor of Anatomy and Surgery, New Orleans College of Dentistry; Secretary Louisiana State Medical Society; First Vice-President Orleans Parish Medical Society. 124 Baronne Street, New Orleans, La.

1897.—Glasgow, Frank A., M.D. Professor of Clinical Gynecology of St. Louis Medical College; Gynecologist to St. Louis Mullanphy Hospital; on Staff of Mission Baptist Sanitarium and of Martha Parsons Free Hospital; Consulting Surgeon to St. Louis Female Hospital. 3894 Washington Boulevard, St. Louis, Mo.

Founder.—Goggans, James A., M.D. Ex-President of the Tri-State Medical Society of Alabama, Georgia, and Tennessee; Senior Councillor of the Medical Association of the State of Alabama; Fellow of the British Gynecological Society. *Vice-President*, 1888. Alexander City, Ala.

1900.—Goldsmith, W. S., M.D. 262 Jackson Street, Atlanta, Ga.

1899.—Goode, Rhett, M.D. Mobile, Ala.

Founder.—Graham, Joseph, M.D. Member Charlotte, North Carolina, Medical Society; ex-Member North Carolina

State Board of Health, and North Carolina State Board of Medical Examiners; ex-President North Carolina State Medical Society. Charlotte, N. C.

1892.—Grant, Horace H., M.D. Professor of Surgery in the Hospital College of Medicine; Surgeon to the Louisville City Hospital. 321 Equitable Building, Louisville, Ky.

1896.—Gwathmey, Lomax, M.D. Attending Gynecologist to St. Vincent Hospital and Dispensary. Norfolk, Va.

Founder.—Hadra, Berthold Ernest, M.D. Formerly Professor of Surgery, Texas Medical College and Hospital; ex-President of the West Texas Medical Association. *Vice-President*, 1890. Dallas, Texas.

1896.—Haggard, William David, M.D. Professor of Gynecology, Medical Department, University of Tennessee; formerly Professor of Gynecology and Abdominal Surgery, University of the South (Sewanee); Gynecologist to Nashville City Hospital; ex-President Nashville Academy of Medicine; ex-Secretary Section on Obstetrics and Diseases of Women, American Medical Association (1898); ex-Secretary Medical Society State of Tennessee (1897–1901); Member of American Association of Obstetricians and Gynecologists, and Alumni Association of Woman's Hospital of New York. *Treasurer*, 1900; *Secretary*, 1900–1902. 302 North Vine Street, Nashville, Tenn.

1892.—Hall, Rufus Bartlett, A.M., M.D. Professor of Clinical Gynecology in the Miami Medical College; Gynecologist to the Presbyterian Hospital; ex-President of the Cincinnati Obstetrical Society; ex-President of the American Association of Obstetricians and Gynecologists; Fellow of British Gynecological Society; Member of the American Medical Association and of the Ohio State Medical Society. 628 Elm Street, Cincinnati, O.

Founder.—Hardon, Virgil Orvin, M.D. Professor of Obstetrics and Diseases of Women and Children, Atlanta College of Physicians and Surgeons; Gynecologist to the Grady Hospital and to St. Joseph's Infirmary; Member of Medical Association of Georgia; ex-Member of American Gynecological Society; ex-President of Atlanta Society of Medicine. *Member of Council*, 1888–1893. 283 Peachtree Street, Atlanta, Ga.

1901.—Hazen, Charles M., M.D. Professor of Physiology, Medical College of Virginia. Bon Air (Richmond), Va.

1896.—Heflin, Wyatt, M.D. President of the Jefferson County Medical Society. Birmingham, Ala.

Founder.—Herff, Ferdinand, M.D. 308 East Houston Street, San Antonio, Texas.

1889.—Hill, Robert Somerville, M.D. Councillor of the Alabama State Medical Association; ex-President of the Medical and Surgical Society of Montgomery County; formerly Surgeon of Second Regiment Alabama State Troops. Montgomery, Ala.

1902.—Hirst, Barton Cooke, M.D. Professor of Obstetrics, University of Pennsylvania; Fellow of College of Physicians, Philadelphia; Gynecologist to the Howard, Orthopedic, and Philadelphia Hospitals; Fellow of American Gynecological Society. 1821 Spruce Street, Philadelphia, Pa.

Founder.—Hogan, S. M., M.D. Grand Senior Councillor and ex-Vice-President of the Medical Association of the State of Alabama. Montgomery, Ala.

1900.—Hoke, Michael, M.D., B.E. 268 Peachtree Street, Atlanta, Ga.

1891.—Holmes, J. B. S., M.D. Ex-President of the Tri-State Medical Society of Alabama, Georgia, and Tennessee; ex-President of the Georgia Medical Association; Fellow of the American Association of Obstetricians and Gynecologists. Atlanta, Ga.

1900.—Horsley, John Shelton, M.D. Surgeon-in-charge St. Luke's Hospital, Surgeon to the Provident Hospital; Honorary Member of the New Mexico Medical Society. El Paso, Texas.

1896.—Hundley, J. Mason, M.D. Associate Professor of Diseases of Women and Children, University of Maryland; President Clinical Society of Baltimore. 1009 Cathedral Street, Baltimore, Md.

1892.—Hunter, H. M., M.D. Union Springs, Ala.

1900.—Ill, Edward Joseph, M.D. Surgeon to the Woman's Hospital; Medical Director, St. Michael's Hospital; Gynecologist and Supervising Obstetrician, St. Barnabas' Hospital; Consulting Gynecologist, German Hospital and Beth Israel Hospital of Newark, N. J.; to All Souls' Hospital, Morristown, N. J., and to Mountain Side Hospital, Montclair, N. J.; Vice-President from New Jersey to Pan-American Congress of 1893. 1002 Broad Street, Newark, N. J.

1888.—*Jelks, James Thomas, M.D. Professor of Gynecology and Syphilology in Barnes Medical College, St. Louis; formerly Professor of Genito-Urinary Surgery and Venereal Diseases in College of Physicians and Surgeons, Chicago; ex-President of Arkansas Medical Society; ex-Secretary Section on Obstetrics and Diseases of Women, American Medical Association; Member of Chicago Medical Society, Mississippi Valley Medical Association, American Association of Obstetricians and Gynecologists; ex-Chairman of Section on Anatomy and Surgery, American Medical Association; Physician and Surgeon, Ozark Sanitarium; Surgeon-General Arkansas National Guards. 218 Central Avenue, Hot Springs, Ark.

1889.—Johnson, Joseph Taber, M.D. Professor of Gynecology and Abdominal Surgery, Georgetown University; formerly Gynecologist to Providence Hospital; Chief of Service of Gynecology and Abdominal Surgery, Georgetown University Hospital, and President of the Board of Administration; President of the Woman's Dispensary, and of the Medical Society of the District of Columbia (1887); Member of the British Medical Association; Fellow of the Gynecological Society; President of the Washington Obstetrical and Gynecological Society; Secretary American Gynecological Society, 1886–1890; President, 1899. *President,* 1899. 926 Farragut Square, Washington, D. C.

Founder.—Johnston, George Ben, M.D. Formerly Consulting Surgeon to the Richmond Eye, Ear, and Throat Infirmary; ex-President of the Richmond Academy of Medicine and Surgery; ex-President of the Medical Society of Virginia; Member of the American Medical Association; Member of the American Association of Obstetricians and Gynecologists, and First Vice-President, 1896; Member of the Ninth International Medical Congress; Member of the American Surgical Association; late Professor of Anatomy in the Medical College of Virginia, and now Professor of the Practice of Surgery and Clinical Surgery; Surgeon to the Old Dominion Hospital; Honorary Member of the State Veterinary Medical Association; Consulting Surgeon to the City Free Dispensary. *Vice-President,* 1892; *President,* 1897. 407 East Grace Street, Richmond, Va.

1901.—Johnston, Robert W., M.D. Professor of Surgery,

* Deceased.

Baltimore Medical College. Corner Franklin and Cathedral Streets, Baltimore, Md.

1902.—Johnstone, Arthur W., M.D. Professor of Gynecology, Woman's Medical College; Fellow of British Gynecological Society; Fellow and ex-Vice-President of American Gynecological Society. Madison Road, Cincinnati, O.

1902.—Jordan, William Mudd, M.D. Birmingham, Ala.

1890.—Kelly, Howard Atwood, M.D. Founder of Kensington Hospital, Philadelphia; Associate Professor of Obstetrics, University of Pennsylvania, 1888–89; Professor of Gynecology and Obstetrics, Johns Hopkins University, 1888–99; Professor of Gynecology, Johns Hopkins University; Gynecologist-in-Chief to Johns Hopkins Hospital; Membre Associé Etrander de la Société Obstétricale et Gynecologique de Paris; Correspondirendes Mitglied der Gesellschaft f. Geburtshülfe zu Leipzig; Honorary Fellow Edinburgh Obstetrical Society, Royal Academy of Medicine (Ireland), and British Gynecological Society; Member Washington Academy of Sciences; Fellow American Gynecological Society. 1418 Eutaw Place, Baltimore, Md.

1895.—Kime, Rufus R., M.D. Ex-President Atlanta Society of Medicine; Ex-President of Atlanta Obstetrical Society; Ex-President of the Tri-State Medical Society of Alabama, Georgia, and Tennessee. 308 English-American Building, Atlanta, Ga.

1899.—Kohlman, William, M.D. 3500 Prytania Street, New Orleans, La.

1897.—Laidley, L. H., M.D. Surgeon to the Protestant Hospital; Professor of Gynecology and Pelvic Surgery, Marion Sims-Beaumont Hospital Medical College; Member of the American Association of Obstetricians and Gynecologists; Member of the American Medical Association. 3538 Washington Ave., St. Louis, Mo.

1899.—Larue, F. A., M.D. Chief of Clinic to the Chair of Surgery, Tulane University of Louisiana; Lecturer on Operative Surgery, New Orleans Polyclinic; Visiting Surgeon to Charity Hospital. 624 Gravier Street, New Orleans, La.

1889.—Le Grand, John C., M.D. Ex-Vice-President of the American Medical Association; President of the Medical Association of the State of Alabama. 111 North Twentieth Street, Birmingham, Ala.

1894.—Leigh, Southgate, M.D. Visiting Surgeon St. Vincent's and Norfolk Protestant Hospitals; First Vice-President Medical Society of Virginia, 1899–1900; Surgeon to Norfolk and Western Railroad; Member American Medical Association, and Tri-State Medical Association of the Carolinas and Virginia, and Seaboard Medical Association. 147 Granby Street, Norfolk, Va.

1893.—Lewis, Ernest S., M.D. Professor of Gynecology, Medical Department of Tulane University. *Vice-President,* 1894; *President,* 1896; *Member of Council,* 1896–1903. 124 Baronne Street, New Orleans, La.

1893.—Lewis, Hampton S., M.D. 124 Baronne Street, New Orleans, La.

1900.—Lloyd, Samuel, M.D. Professor of Surgery, New York Post-Graduate Medical School; Attending Surgeon, Post-Graduate Hospital, and to the Babies' Wards. 24 West Fiftieth Street, New York, N. Y.

Founder.—Long, John W., M.D. Emeritus Professor of Gynecology and Pediatrics in the Medical College of Virginia; formerly Gynecologist to the Old Dominion Hospital and the Richmond City Dispensary; Honorary Member of the Alumnæ Association of the Medical College of Virginia; Consulting Surgeon to the Watts Hospital, Durham; Member, ex-Orator, and ex-Vice-President of the North Carolina Medical Society; Honorary Member of the Randolph County Medical Society; Member of the Rowan County Medical Society. *Vice-President,* 1902. Salisbury, N. C.

1902.—McAdory, Wellington P., M.D. Surgeon to Hillman Hospital. Birmingham, Ala.

1895.—McGannon, M. C., M.D. Professor of Gynecology, Medical Department, University of Nashville. 301 North Spruce Street, Nashville, Tenn.

1893.—McGuire, Stewart, M.D. Professor of the Principles of Surgery and Clinical Surgery, University College of Medicine; Surgeon-in-Charge, St. Luke's Hospital; Visiting Surgeon, Virginia Hospital; Consulting Surgeon, Virginia Home for Incurables. 518 East Grace Street, Richmond, Va.

1891.—McGuire, William Edward, M.D. 411 East Grace Street, Richmond, Va.

1888.—McMurtry, Lewis S., M.D. Professor of Gynecology and Abdominal Surgery, Hospital College of Medicine,

Louisville; Gynecologist to St. Mary and St. Elizabeth Hospital; Gynecologist to Gray Street Infirmary; ex-President of the American Association of Obstetricians and Gynecologists; ex-President of the Kentucky State Medical Society; Corresponding Member of the Gynecological Society of Boston; Fellow of the British Gynecological Society; Ordinary Fellow of the Edinburgh Obstetrical Society. *President*, 1891; *Member of Council*, 1892–1894. 1912 Sixth Street, Louisville, Ky.

1888.—McRae, Floyd Willcox, M.D. Professor of Gastro-Intestinal, Rectal, and Clinical Surgery, Atlanta College of Physicians and Surgeons; Surgeon to Grady Hospital; ex-President Medical Association of Georgia; ex-Secretary of Section on Surgery and Anatomy, American Medical Association; Member American Medical Association. *Treasurer*, 1900–1903. Peters Building, Atlanta, Ga.

1900.—MacDonald, Willis G., M.D. Professor of Surgery (Adjunct), Albany Medical College; Surgeon to Albany Hospital; Chief Surgeon of South End Dispensary, etc. 29 Eagle Street, Albany, N. Y.

1900.—Manton, Walter Porter, M.D. Gynecologist to Harper Hospital, Eastern and Northern Asylum for the Insane; Consulting Gynecologist to St. Joseph's Retreat; Vice-President of Medical Board of the Woman's Hospital and Infants' Home; Professor of Clinical Gynecology and Adjunct Professor of Obstetrics, Detroit College of Medicine, etc. 32 Adams Avenue, Detroit, Mich.

1891.—Marcy, Henry Orlando, M.D., LL.D. Ex-President of the American Medical Association; President of the Section of Gynecology, Ninth International Medical Congress; late President of the American Academy of Medicine; Corresponding Member of the Medico-Chirurgical Society of Bologna, Italy; Fellow of the American Association of Obstetricians and Gynecologists. 336–338 Boylston Street, Boston, Mass.

1899.—Martin, Edmund Denegre, M.D. Professor of Minor and Clinical Surgery, New Orleans Polyclinic; Visiting Surgeon to the Charity Hospital; Consulting Surgeon to the Eye, Ear, Nose, and Throat Hospital; Surgeon to N. O. N. E. R. R. Co.; Chairman Surgical Section State Medical Society; President Orleans Parish Medical Society. 115 Chartres Street, New Orleans, La.

1899.—Mastin, William M., M.D. Fellow of the American Surgical Association; Member of the American Association of Genito-Urinary Surgeons; Surgeon to the Mobile City Hospital. Joachim and Conti Streets, Mobile, Ala.

1893.—Matas, R., M.D. Professor of Surgery, Medical Department of Tulane University; Fellow of the American Surgical Association. 624 Gravier Street, New Orleans, La.

1896.—Matthews, William P., M.D. Professor of Anatomy, Medical College of Virginia; Orthopedic Surgeon to the Old Dominion Hospital. Richmond, Va.

1902.—Mayo, Charles H., M.D. Attending Surgeon, St. Mary's Hospital. Rochester, Minn.

Founder.—Meriwether, Frank T., M.D. Assistant Surgeon, U. S. A. Retired. Asheville, N. C.

1899.—Michinard, P. E., M.D. 624 Gravier Street, New Orleans, La.

1888.—Miller, C. Jeff., M.D. Chief of Clinic to the Chair of Diseases of Women and Obstetrics, Tulane University of Louisiana; Lecturer on Gynecology and Obstetrics in New Orleans Polyclinic; Visiting Gynecologist to Charity Hospital. 1719 Jackson Avenue, New Orleans, La.

1899.—Milliken, Samuel E., M.D. 449 Elm Street, Dallas, Texas.

1901.—Mixter, Samuel Jason, M.D. Surgeon, Massachusetts General Hospital; Consulting Surgeon, Massachusetts Charity Eye and Ear Infirmary; Instructor of Surgery, Harvard Medical School. 180 Marlborough Street, Boston, Mass.

1902.—Morris, Lewis C., M.D. Professor of Anatomy and Associate Professor of Gynecology, Birmingham Medical College; Councillor of Medical Association, State of Alabama; Vice-President of Tri-State Medical Society of Alabama, Georgia, and Tennessee. 716 North Eighteenth Street, Birmingham, Ala.

1900.—Morris, Robert Tuttle, M.D. Professor of Surgery, New York Post-Graduate Medical School and Hospital. 58 West Fifty-sixth Street, New York, N. Y.

1901.—Mullally, Lane, M.D. Demonstrator of Anatomy and Lecturer on Diseases of Children, Medical College State of South Carolina. Charleston, S. C.

1891.—Murfree, James Brickle, M.D. Professor of Surgery, University of the South (Sewanee); ex-President of the Tennessee State Medical Society, and of the Tri-State Medical

Society of Alabama, Georgia, and Tennessee. Murfreesboro, Tenn.

1894.—Murphy, J. B., M.D. Professor of Surgery, Northwestern University; Professor of Surgery, Post-Graduate School and Hospital; Attending Surgeon to Cook County and Mercy Hospitals; 100 State Street, Chicago, Ill.

Founder.—Nash, Herbert Milton, M.D. Consulting Surgeon to the Retreat for the Sick (Hospital), Norfolk; Consultant to the Staff of St. Vincent's Hospital; ex-President of the Norfolk City Medical Society; Member of the State Board of Medical Examiners of Virginia. 296 Freemason Street, Norfolk, Va.

1899.—Neff, Wallace, M.D. Formerly Adjunct Professor of Clinical Surgery and Surgical Pathology, Medical College of Ohio (University of Cincinnati); late Major and Brigade Surgeon U. S. V. 1337 K Street, Washington, D. C.

1891.—Nelson, H. T., M.D. Member of the Medical Examining Board of Virginia. Charlottesville, Va.

1889.—Nicolson, William Perrin, M.D. Professor of Anatomy and Clinical Surgery, Atlanta College of Physicians and Surgeons. Prudential Building, Atlanta, Ga.

1896.—Noble, Charles P., M.D. Surgeon-in-Chief, Kensington Hospital for Women; Consulting Surgeon, Woman's Hospital; Lecturer on Gynecology, Philadelphia Polyclinic. 1500 Locust Street, Philadelphia, Pa.

1890.—Noble, George H., M.D. Ex-President of the Georgia Medical Association; ex-Secretary of Obstetrical Section of the American Medical Association. 131 South Pryor Street, Atlanta, Ga.

1890.—Nunn, R. J., M.D. Savannah, Ga.

1902.—O'Brien, Matthew Watson, M.D. Surgeon Southern, and Chesapeake and Ohio Railways; Member of the American Association for the Advancement of Science. 908 Cameron Street, Alexandria, Va.

1901.—Ochsner, A. J., M.D. Adjunct Professor of Clinical Surgery, College of Physicians and Surgeons; Surgeon-in-Chief Augustana and St. Mary's Hospital. 710 Sedgwick Street, Chicago, Ill.

1902.—Oliver, John Chadwick, M.D. Dean and Professor of Operative Surgery, Miami Medical College; Surgeon to the Cincinnati, Christ, and Presbyterian Hospitals. 628 Elm Street, Cincinnati, Ohio.

1902.—Oviatt, Charles W., M.D. Formerly Professor of Surgery in Milwaukee Medical College; Attending Surgeon St. Mary's Hospital. Oshkosh, Wis.

Founder.—Paine, John Fannin Young, M.D. Professor of Obstetrics and Gynecology in the Medical Department, University of Texas; Gynecologist and Obstetrician, John Sealy Hospital; Fellow of the American Association of Obstetricians and Gynecologists; ex-President of the Texas Medical Association; Fellow of the Texas Academy of Science. 2177 Market Street, Galveston, Texas.

1888.—Parham, F. W., M.D. Professor in the New Orleans Polyclinic. 1429 Seventh Street, New Orleans, La.

1900.—Park, Roswell, M.D. Professor of Surgery, Medical Department, University of Buffalo; Surgeon, Buffalo General Hospital; Member German Congress of Surgeons, Italian Surgical Society, American Surgical Association, American Orthopedic, and American Genito-Urinary Associations. 510 Delaware Avenue, Buffalo, N. Y.

1893.—Parker, William E., M.D. Visiting Surgeon to the Charity Hospital. *Vice-President*, 1897. 151 Central Avenue, Hot Springs, Ark.

1899.—Perkins, W. M., M.D. Chief of the Clinic Chair of General Clinical and Operative Surgery, New Orleans Polyclinic; Assistant Demonstrator of Operative Surgery, Medical Department, Tulane University of Louisiana; Visiting Surgeon to the Charity Hospital. 205 Baronne Street, New Orleans, La.

1899.—Platt, Walter Brewster, M.D. Surgeon to the Robert Garrett Hospital for Children. 802 Cathedral Street, Baltimore, Md.

1889.—Polk, William M., M.D. Dean and Professor of Obstetrics and Gynecology, Cornell University Medical College; Gynecologist to Bellevue Hospital; Consulting Surgeon to St. Luke's, St. Vincent's, New York Lying-in, and Trinity Hospitals; ex-President of American Gynecological Society, and New York Obstetrical Society. 7 East Thirty-sixth Street, New York.

1900.—Porter, Miles F., M.D. Trustee of American Medical Association. 47 West Wayne Street, Fort Wayne, Ind.

1889.—Potter, William Warren, M.D. Consulting Gynecologist to the Woman's Hospital; Consulting Surgeon to the

Buffalo General Hospital; President and Examiner in Obstetrics, New York State Medical Examining and Licensing Board; Chairman of Section of Obstetrics and Diseases of Women, American Medical Association, 1890; President of the Buffalo Obstetrical Society, 1884–1886; President of the Medical Society of the State of New York, 1891; Executive President of the Section of Gynecology and Abdominal Surgery, Pan-American Medical College, 1893. 284 Franklin Street, Buffalo, N. Y.

1894.—Powell, Seneca D., M.D., LL.D. Professor of Surgery, New York Post-Graduate Medical School and Hospital, and Secretary to the Faculty; Visiting Surgeon to the Post-Graduate Hospital and to St. Mark's Hospital. 12 West Fortieth Street, New York, N. Y.

1889.—Price, Joseph, M.D. Physician-in-Charge of the Obstetrical and Gynecological Department of the Philadelphia Dispensary; Fellow of the American Association of Obstetricians and Gynecologists; ex-Chairman, Section of Diseases of Women and Obstetrics, American Medical Association. *Vice-President,* 1893. 241 North Eighteenth Street, Philadelphia, Pa.

1900.—Pryor, William Rice, M.D. Professor of Gynecology, New York Polyclinic; Consulting Gynecologist, St. Elizabeth's Hospital and to New York City Hospital; Fondateur Congress Internationale Gynecologie et d'Obstetrique; Member American Gynecological, New York Obstetrical, and New York Pathological Societies; Fellow Academy of Medicine; Member Society Alumni, Bellevue Hospital. 6 W. 84th Street, New York, N. Y.

1899.—Quinn, W. A., M.D. Henderson, Ky.

1900.—Ransohoff, Joseph, M.D., F.R.C.S. Professor of Anatomy and Clinical Surgery, Medical College of Ohio; Surgeon to Cincinnati, Good Samaritan, and Jewish Hospitals; Member American Surgical Association. 706 Walnut Street, Cincinnati, Ohio.

1890.—Reed, Charles Alfred Lee, M.D. Ex-President of the American Medical Association; Professor of Gynecology and Abdominal Surgery in the Cincinnati College of Medicine and Surgery; Surgeon to the Cincinnati Free Hospital for Women; Fellow of the American Association of Obstetricians and Gynecologists; Fellow of the British Gynecological Society; ex-Chairman of the Section on Obstetrics and Dis-

eases of Women of the American Medical Association; Secretary-General of the Pan-American Medical Congress, 1893; Honorary Member of the Medical Society of the State of New York. Corner Seventh and Race Streets, Cincinnati, Ohio.

1900.—Rees, Charles M., M.D. Professor of Obstetrics, Charleston Medical School; Gynecologist to Shirro's Dispensary. Charleston, S. C.

1899.—Richardson, Maurice Howe, M.D. Visiting Surgeon to the Massachusetts General Hospital; Assistant Professor of Clinical Surgery, Harvard Medical School. 224 Beacon Street, Boston, Mass.

1901.—Ricketts, Edwin, M.D. Professor of Abdominal Surgery and Gynecology at the Cincinnati Polyclinic; Member of the American and British Medical Associations; Ex-President of the American Association of Obstetricians and Gynecologists. 415 Broadway, Cincinnati, Ohio.

1888.—Roberts, William O., M.D. Professor of Principles of Surgery and Clinical Surgery, Medical Department of the University of Louisville; formerly Secretary of the Surgical Section of the American Medical Association. *Vice-President,* 1889. 1520 Third Street, Louisville, Ky.

1901.—Robins, Charles Russell, M.D. Lecturer on Gynecology, Instructor in Gynecology and Abdominal Surgery, Attending Obstetrician, Outside Obstetrical Department, Medical College of Virginia; Local Surgeon, Atlantic Coast Line Railroad. 17 North Fifth Street, Richmond, Va.

1889.—Robinson, William Lovaille, M.D. Fellow of the American Association of Obstetricians and Gynecologists; ex-President of the Danville Medical Society; Member of the Medical Examining Board of Virginia; ex-President of Virginia Medical Society. 753 Main Street, Danville, Va.

1892.—Rodman, William L., M.D. Professor of the Principles of Surgery and Clinical Surgery in the Medico-Chirurgical College. 1626 Spruce Street, Philadelphia, Pa.

1901.—Rogers, Mack, M.D. Professor of Anatomy, Birmingham Medical College. 212 Twentieth Street, Birmingham, Ala.

Founder.—Rogers, William Boddie, M.D. Professor of the Practice of Surgery and Clinical Surgery, Memphis Hospital Medical College; ex-Vice-President of the American Medical Association, and National Association of Railway Surgeons. Porter Building, Memphis, Tenn.

1901.—Rosser, Charles M., M.D. Dean, Medical Department, University of Dallas; ex-President Texas State Medical Association. 506 North Texas Building, Dallas, Texas.

1890.—Royster, Hubert A., A.B., M.D. One of the Visiting Staff of the Rex Hospital; Surgeon-in-Charge of St. Agnes' Hospital. Tucker Building, Raleigh, N. C.

1901.—Runyan, Joseph P., M.D. 203 West Second Street, Little Rock, Ark.

1893.—Saunders, Bacon, M.D. Professor of Surgery and Clinical Surgery and Dean of Faculty of Medical Department, Fort Worth University; Chief Surgeon Fort Worth and Denver City Railway, and of Wichita Valley Railway; Division Surgeon, Texas Pacific Railway, Gulf, Colorado, and Santa Fé Railway, and St. Louis and Southwestern Railway; ex-President Texas State Medical Association; Member American Medical Association, and the International Association of Railway Surgeons, etc. *Vice-President*, 1903. Ninth and Houston Streets, Fort Worth, Texas.

Founder.—Schilling, Nicholas, M.D. Cedar Bayou, Texas.

1893.—Senn, Nicholas, M.D., Ph.D., LL.D. Professor of Practice of Surgery and Clinical Surgery, Rush Medical College; Professor of the Practice of Surgery, Chicago Polyclinic; Attending Surgeon, Presbyterian Hospital; Surgeon to St. Joseph's Hospital; ex-President of the American Surgical Association and of the American Medical Association. 532 Dearborn Avenue, Chicago, Ill.

1899.—Shands, A. R., M.D. Professor of Orthopedic Surgery, Columbian University. 1328 New York Avenue, N. W., Washington, D. C.

1902.—Sherrill, J. Garland, M.D. Professor of Surgery and Clinical Surgery, Kentucky University; Consulting Surgeon to Louisville Hospital. 633 St. Charles Place, Louisville, Ky.

Founder.—Shivers, Offa Lundsford, M.D. Councillor of the Alabama Medical Association. Marion, Ala.

1893.—Simons, Manning, M.D. Professor of Clinical Surgery, Medical College, State of South Carolina; Surgeon to St. Francis Xavier's Infirmary; Surgeon to City Hospital; ex-President Medical Society of South Carolina; President of the South Carolina Medical Association; Member American Association of Obstetricians and Gynecologists; ex-Vice-President Tri-State Medical Society of Virginia and the Carolinas. *Vice-*

President, 1895 and 1900; *President*, 1901. 111 Church Street, Charleston, S. C.

1900.—Simpson, Frank Farrow, M.D. Assistant Gynecologist to Mercy Hospital; Gynecologist to Out-patient Department, Mercy Hospital. 524 Pennsylvania Avenue, Pittsburg, Pa.

1894.—Smith, Reginald K., M.D. Surgeon U. S. Navy. 507 Harrison Street, San Francisco, Cal.

1899.—Smythe, Frank Davie, M.D. Surgeon to St. Joseph's Hospital; Assistant Professor of Surgery, Memphis Hospital Medical College; Demonstrator of Operative Surgery; formerly Member of the State Board of Examiners of Mississippi. Porter Building, Memphis, Tenn.

Founder.—Souchon, Edmond, M.D. Professor of Anatomy and Clinical Surgery, Medical Department of Tulane University; Member of the American Surgical Association; President Louisiana State Board of Health. 135 Baronne Street, New Orleans, La.

Founder.—Stone, Isaac Scott, M.D. Clinical Professor Gynecology, Georgetown University; Gynecologist of Columbia Hospital; Member American and British Gynecological Societies; Honorary Fellow of Medical Society of the State of New York; Fellow of the Medical Society of Virginia; Member Washington Academy of Sciences, Washington Obstetrical and Gynecological Society, Medical Society, and Medical and Surgical Society of the District of Columbia. 1449 Rhode Island Avenue, N. W., Washington, D. C.

1894. — Talley, D. F., M.D. Ex-President Jefferson County Medical Society; Professor of Materia Medica and Lecturer on Surgery, Birmingham Medical College, Birmingham, Ala.

1902.—Tate, Magnus, A., M.D. Lecturer on Anatomy of the Female Pelvic Viscera and Embryology, Miami Medical College; Assistant Gynecologist to St. Mary's Hospital; Consulting Obstetrician to Speer's Hospital; Member American Association of Obstetricians and Gynecologists. Third and Broadway, Cincinnati, O.

Founder.—Taylor, Benjamin W., M.D. Ex-President of Columbia Medical Society and of South Carolina State Medical Association; Chief Surgeon Columbia Hospital; President of Board of Regents, South Carolina Hospital for the Insane; Consulting Surgeon South Carolina Hospital for the Insane;

Member of the National Railway Surgeons and American Medical Associations; ex-Member of State Board of Medical Examiners. 1409 Plain Street, Columbia, S. C.

Founder.—Taylor, Hugh M., M.D. Professor of Practice of Surgery and Clinical Surgery, University College of Medicine; Surgeon to the Virginia Hospital; ex-President of the Virginia Board of Medical Examiners. 6 North Fifth Street, Richmond, Va.

1898.—Taylor, William Wood, A.B., M.D. Gynecologist to St. Joseph's and the Memphis City Hospitals. 246 Randolph Building, Memphis, Tenn.

1892.—Thompson, J. E., M.D. Professor of Surgery in the University of Texas. Galveston, Texas.

1891.—Tiffany, Louis McLane, M.D. Professor of Surgery in the University of Maryland; Fellow of the American Surgical Association. *President,* 1895. 831 Park Avenue, Baltimore, Md.

1890.—Tompkins, Christopher, M.D. Professor of Obstetrics in the Medical College of Virginia. *Vice-President,* 1903. 116 East Franklin Street, Richmond, Va.

1888.—Tuholske, Herman, M.D. Professor of Surgery, Medical Department, Washington University; Consulting Surgeon, St. Louis City Hospital; Surgeon to St. Louis Polyclinic Hospital, etc. 410 North Jefferson Street, St. Louis, Mo.

1893.—Vander Veer, Albert, M.D. Professor of Clinical, Didactic, and Abdominal Surgery, Albany Medical College; Fellow of the American Surgical Association; ex-President of the American Association of Obstetricians and Gynecologists; ex-President of the Medical Society of the State of New York. 28 Eagle Street, Albany, N. Y.

1891.—Walker, Edwin, M.D., Ph.D. Gynecologist to the Evansville City Hospital; ex-President Mississippi Valley Medical Association; President of the Indiana State Medical Society; Fellow of the American Association of Obstetricians and Gynecologists. 712 Upper Fourth Street, Evansville, Ind.

1898.—Watkins, Isaac Lafayette, M.D. President of the Montgomery County Medical and Surgical Society. Montgomery, Ala.

1901.—Werder, X. O., M.D. Gynecologist, Mercy Hospital, Pittsburg; Professor of Gynecology, West Pennsylvania

Medical College; Consulting Surgeon to the South Side Hospital, Allegheny General Hospital, St. Francis' Hospital, etc. 524 Pennsylvania Avenue, Pittsburg, Pa.

1888.—WESTMORELAND, WILLIS F., M.D. Professor of Surgery, Atlanta College of Physicians and Surgeons. 241 Equitable Building, Atlanta, Ga.

1902.—WHITACRE, HORACE J., M.D., B.S. Professor of Pathology and Surgeon to Clinics, Medical Department University of Cincinnati; Surgeon to Christ Hospital; Consulting Surgeon to Speer's Hospital; President Cincinnati Research Society; Assistant Pathologist Cincinnati Hospital; Surgeon to Norfolk and Western R. R. 831 Union Trust Building, Cincinnati, O.

1900.—WILLIAMS, ENNION G., M.D. 315 East Grace Street, Richmond, Va.

1900.—WILLIAMS, HOWARD J., A.B., A.M., M.D. Surgeon to Macon Hospital; Chief Surgeon to M., D. & S. R. R.; Surgeon to Central of Ga. R. R., So. Rwy. and Ga. R. R.; ex-President of the Medical Association of Georgia, etc. 550 Orange Street, Macon, Ga.

1900.—WILLIAMS, J. WHITRIDGE, A.B., M.D. Professor of Obstetrics, Johns Hopkins University; Pathologist to Woman's Hospital of Maryland. 845 Park Avenue, Baltimore, Md.

1897.—WILLIAMS, ROBERT F., M.D. Professor of Materia Medica and Therapeutics, and Clinical Lecturer on Practice of Medicine, Medical College of Virginia; Visiting Physician to Old Dominion Hospital, and City Free Dispensary. 508 East Grace Street, Richmond, Va.

Founder.—WILSON, J. T., M.D. Ex-President of the North Texas Medical Association; President of the Texas Medical Association; Superintendent of the State Hospital for the Insane. *Vice-President*, 1891. Sherman, Texas.

1891.—WYETH, JOHN ALLEN, M.D. Ex-President of the American Medical Association (1901). Professor of Surgery in the New York Polyclinic; Consulting Surgeon to St. Elizabeth's Hospital; Visiting Surgeon to Mt. Sinai Hospital and Polyclinic Hospital; Honorary Member of the Texas State Medical Association; President of the New York State Medical Association; ex-President of the New York Pathological Society. 19 West Thirty-fifth Street, New York, N. Y.

1900.—WYSOR, JOHN C., M.D. Surgeon-in-Charge, C. & O. Hospital. Clifton Forge, Va.

1900.—Young, Hugh H., M.D. Chief of Clinic, Genito-Urinary Surgery, Johns Hopkins Hospital. 1005 North Charles Street, Baltimore, Md.

1902.—Zinke, E. Gustav, M.D. Professor of Obstetrics in Medical College of Ohio; Obstetrician and Gynecologist German Protestant Hospital; Attending Obstetrician to Ohio Maternity; Fellow of American Association of Obstetricians and Gynecologists. 13 Garfield Place, Cincinnati, O.

CONSTITUTION.

ARTICLE I.

The name of this Association shall be THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

ARTICLE II.

The object of this Association is to further the study and practice of surgery and gynecology among the profession of the Southern States.

ARTICLE III.

This Association shall adopt and conform to the Code of Ethics of the American Medical Association.

ARTICLE IV.

SECTION 1. Any reputable physician who practises surgery or gynecology, and who is vouched for by two members of the Association and recommended by the Council, shall be eligible to membership in this body.

SEC. 2. The honorary members shall not exceed ten in number, and shall enjoy all the privileges of other members, excepting to vote or hold office, but shall not be required to pay any fee.

ARTICLE V.

SECTION 1. The officers of this Association shall be a President, two Vice-Presidents, a Secretary, a Treasurer, and a Council, elected by ballot.

SEC. 2. The President and Vice-Presidents shall be elected for one year, and the President shall not be eligible for re-election at any time; the Secretary and Treasurer, each, for five years; and the Council as provided for in the By-laws.

ARTICLE VI.

SECTION 1. It shall be the duty of the President to preside at all meetings of the Association; to give the casting vote; to see that the rules of order and decorum be properly enforced in all deliberations of the Association; to sign the approved proceedings of each meeting, and to approve such orders as may be drawn upon the Treasurer for expenditures ordered by the Association.

SEC. 2. In the absence of the President the first Vice-President shall preside, and in his absence the second Vice-President shall preside.

SEC. 3. In the absence of all three, the Association shall elect one of its members to preside *pro tem.*

SEC. 4. It shall be the duty of the Secretary to keep a true and correct record of the proceedings of the meetings; to preserve all books, papers, and articles belonging to the archives of the Association; to attest all orders drawn on the Treasurer for moneys appropriated by the Association; to keep the account of the Association with its members; to keep a register of the members, with the dates of their admission and places of residence. He shall collect all moneys due from the members and pay to the Treasurer, taking his receipt for the same. He shall report such unfinished business of previous meetings as may appear on his books requiring action, and attend to such other business as the Association may direct. He shall also supervise and conduct all the correspondence of the Association, and edit the TRANSACTIONS under the direction of the Council.

SEC. 5. It shall be the duty of the Treasurer to keep a correct record of all moneys received from the hands of the Secretary, giving his receipt for the same; pay them out by order of the Association as indorsed by the President and attested by the seal in the hands of the Secretary.

SEC. 6. It shall be the duty of the President of the Association to appoint an Auditing Committee, consisting of three members of the Association, whose duty it shall be to examine the books of the Secretary and Treasurer, and report on the same on the last day of the session.

ARTICLE VII.

Vacancies occurring in the offices of the Association shall be filled by appointment of the President until the next meeting. He shall also have the appointment of all committees not otherwise provided for.

ARTICLE VIII.

This Constitution shall take effect immediately from the time of its adoption, and shall not be amended except by a written resolution, which shall lie over one year, and receive a vote of two-thirds of the members present.

ARTICLE IX.

Any member who for three consecutive years fails to attend the meetings shall be dropped from the roll of membership.

ARTICLE X.

The membership of the Association shall be limited to two hundred.

ARTICLE XI.

All members who have been in continuous membership for twenty years and have attended fifty per cent. of the meetings shall become life members and be exempt from dues.

BY-LAWS.

ARTICLE I.

The Southern Surgical and Gynecological Association shall meet annually on the second Tuesday of November at 10 A.M., at such place as may be designated by the preceding meeting.

ARTICLE II.

The members present shall constitute a quorum for business.

ARTICLE III.

The annual dues of each member shall be $10, paid in advance.

ARTICLE IV.

The usual parliamentary rules governing deliberative bodies shall govern the business workings of this Association.

ARTICLE V.

All questions before the Association shall be determined by a majority of the votes present.

ARTICLE VI.

The President shall deliver an annual address at each meeting of the Association.

ARTICLE VII.

The Secretary of the Association shall receive, at each annual Session, a draft from the President, drawn on the Treasurer, for the sum of $500 for services rendered the Association, and to this shall be added the necessary expense incurred in the discharge of his official duties.

ARTICLE VIII.

It shall be the duty of the Secretary, one month prior to the annual meeting, to notify the members of the Association, and urge their attendance.

ARTICLE IX.

The authors of papers shall notify the Secretary, six weeks prior to the meeting, of the titles of their essays, so that they may be incorporated in the preliminary programme.

ARTICLE X.

COUNCIL.

The Council shall consist of five members; and of those elected at the primary meeting, the first shall serve five years, the second four, the third three, the fourth two, and the fifth one year; so that subsequently one member of the Council shall be elected annually to serve five years. The President and Secretary shall be *ex-officio* members of the Council.

This Council shall organize by electing a Chairman and Secretary, and shall keep a record of its proceedings.

The duties of this Council shall be—

1. To investigate applications for membership and report to the Association the names of such persons as are deemed worthy.

2. To take cognizance of all questions of an ethical, judicial, or personal nature, and upon these the decision of the Council shall be final; *provided*, that appeal may be taken from such decision of the Council to the Association, under a written protest, which protest shall be sustained by the Association, and the matter shall then be referred to a special committee, with power to take final action.

3. All motions and resolutions before the Association shall be referred to the Council without debate, and it shall report by recommendation at as early an hour as possible.

ARTICLE XI.

The President shall appoint at each annual meeting a Committee of Arrangements.

ARTICLE XII.

The Council shall have full power to omit from the published TRANSACTIONS, in part or in whole, any paper that may be referred to it by the Association, unless specially instructed to the contrary by the Association, which will be determined by vote.

ARTICLE XIII.

Any member failing to pay his dues for more than one year shall be dropped.

ARTICLE XIV.

No paper shall be read before this Association which does not deal strictly with a subject of surgical or gynecological importance.

ARTICLE XV.

No paper read before the Association shall be published in any medical journal or pamphlet for circulation, as having been read before the Association, without having received the indorsement of the Council.

ARTICLE XVI.

The reading of papers shall be limited to twenty minutes each, except by permission of the Association.

MINUTES OF THE PROCEEDINGS

AT THE

FIFTEENTH ANNUAL MEETING

OF

THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION,

HELD AT THE

GRAND HOTEL,

Cincinnati, Ohio,

NOVEMBER 11, 12 AND 13, 1902.

FIFTEENTH ANNUAL MEETING.

FIRST DAY.—*Tuesday, November* 11, 1902.

The following-named members were present:

BAUGHMAN, GREER ..... Richmond, Va.
BLACK, J. M. ..... Knoxville, Tenn.
BOLDT, HERMANN J. ..... New York City, N.Y.
BOSHER, L. C. ..... Richmond, Va.
BOVEE, J. W. ..... Washington, D. C.
BYFORD, H. T. ..... Chicago, Ill.
CARTLEDGE, A. M. ..... Louisville, Ky.
CATHCART, R. S. ..... Charleston, S. C.
DANDRIDGE, N. P. ..... Cincinnati, O.
DAVIS, W. E. B. ..... Birmingham, Ala.
ENGELMANN, GEO. J. ..... Boston, Mass.
FERGUSON, A. H. ..... Chicago, Ill.
FORT, R. E. ..... Nashville, Tenn.
GRANT, H. H. ..... Louisville, Ky.
HAGGARD, W. D. ..... Nashville, Tenn.
HALL, RUFUS B. ..... Cincinnati, O.
HARDON, V. O. ..... Atlanta, Ga.
JOHNSON, JOSEPH TABER ..... Washington, D. C.
JOHNSTON, G. B. ..... Richmond, Va.
LLOYD, SAMUEL ..... New York City, N.Y.
MCGANNON, M. C. ..... Nashville, Tenn.
MCGUIRE, W. E. ..... Richmond, Va.
MCMURTRY, L. S. ..... Louisville, Ky.
MANTON, W. P. ..... Detroit, Mich.
MILLIKEN, S. E. ..... Dallas, Texas.
MORRIS, R. T. ..... New York City, N.Y.
NOBLE, CHARLES P. ..... Philadelphia, Pa.
NOBLE, GEORGE H. ..... Atlanta, Ga.
POTTER, W. W. ..... Buffalo, N. Y.
PRICE, JOSEPH ..... Philadelphia, Pa.

Quinn, W. A. . . . . Henderson, Ky.
Ransohoff, Joseph . . . . . Cincinnati, O.
Reamy, Thaddeus A. . . . . Cincinnati, O.
Reed, C. A. L. . . . . Cincinnati, O.
Rees, Charles M. . . . . Charleston, S. C.
Richardson, M. H. . . . . Boston, Mass.
Robins, Charles R. . . . . Richmond, Va.
Rogers, Mack . . . . . Birmingham, Ala.
Rosser, C. M. . . . . Dallas, Tex.
Royster, H. A. . . . . Raleigh, N. C.
Saunders, B. . . . . Fort Worth, Texas.
Simpson, F. F. . . . . Pittsburg, Pa.
Taylor, H. M. . . . . Richmond, Va.
Tompkins, C. . . . . Richmond, Va.
Walker, E. . . . . Evansville, Ind.
Watkins, I. L. . . . . Montgomery, Ala.
Westmoreland, W. F. . . . . Atlanta, Ga.
Williams, H. J. . . . . Macon, Ga.
Young, H. H. . . . . Baltimore, Md.

NEW MEMBERS PRESENT.

Bonifield, C. L. . . . . Cincinnati, O.
Broome, G. W. . . . . St. Louis, Mo.
Caldwell, C. E. . . . . Cincinnati, O.
Dudley, A. P. . . . . New York City, N.Y.
Freiberg, A. H. . . . . Cincinnati, O.
Johnstone, A. W. . . . . Cincinnati, O.
McAdory, W. P. . . . . Birmingham, Ala.
Mayo, C. H. . . . . Rochester, Minn.
Morris, L. C. . . . . Birmingham, Ala.
Oliver, J. C. . . . . Cincinnati, O.
Oviatt, C. W. . . . . Oshkosh, Wis.
Sherrill, J. G. . . . . Louisville, Ky.
Tate, M. A. . . . . Cincinnati, O.
Whitacre, Horace . . . . . Cincinnati, O.
Zinke, E. Gustav . . . . . Cincinnati, O.

Morning Session.—The Association convened at the Grand Hotel, at 10 a.m., and was called to order by the President, Dr. W. E. B. Davis, of Birmingham, Alabama.

Dr. Thaddeus A. Reamy, Chairman of the Committee of Arrangements, delivered the following

ADDRESS OF WELCOME.

Mr. President and Fellows of the Southern Surgical and Gynecological Association: It is my pleasant duty, officially and on behalf of the medical profession of Cincinnati, to welcome you to our city and to our homes. This is the first time during your sixteen years of existence as an Association that, in annual session, you have crossed the Ohio. Seventy-one per cent. of the membership of this Association are resident in the so-called Southern States. In a beautiful spirit of generosity you have admitted to membership a small group of us from the East and the North and the West, and be assured that we are proud of the Fellowship.

Born in the South, our distinguished President, Dr. Davis, if not truthfully and specifically the father, was at least godfather at the baptismal consecration. And though the infant society has grown to maturity and power in the medical world, he is still at home with it, tenderly loving it. I hope that this Association, however national or international it may become, will never drop the word Southern from its name; not that there is now, or ever was, with medical men, socially or professionally, any North or South. Within the memory of many now present, however, States separated, political parties were disrupted, churches divided, families were estranged, special societies and organizations which had previously worked in harmony and love for charity and humanity turned away in bitterness; but medical men, North and South, cemented together in a holy work for science and for humanity, were undivided. (Applause.)

Our young men here and elsewhere know of this Association and its work. They have read your annual volume of TRANSACTIONS, and find that your output is of a high order. These volumes now compare favorably with those of any similar society in the world. Attracted by your work and charmed by your personalities, as they will be when they come to know you as I do, you must not be surprised should quite a number from our midst seek membership. Well, you will find them duly and truly prepared, worthy and well qualified. Admit them.

Again, referring to the time and locality of your birth, the glory of surgery and of gynecology, and of medicine in this country would be less, the stars shining in the professional

firmament would have been fewer and of less lustre were, the men of the South dropped from the roll of fame. Some dead, some living, many of them, unlike other stars, changed their orbits Eastward, and with new constellations the glow undimmed illuminates the pathway. As illustrious sons and successors, you are bearing aloft the colors committed to your hands. We are honored in welcoming you as our guests.

You will observe that we have not supplied you with badges for your coat lapels. Be assured that this omission was not a stroke of economy on the part of our Committee. You need no such mark of recognition. No man can become a member of this Society until he has shown by actual work that he is composed of the genuine mettle. The true doctor is a marked man. He needs no badge. He has been baptized in that fire that burns into the soul, but does not consume; that writes into the very countenance the commingled lines of charity, forbearance, and knowledge. He keeps vigil with the sick and the suffering while others sleep. Out of his heart he speaks words of sympathy, comfort, and encouragement in the house of sorrow. When the merchant, the banker, lawyer, and the clergyman have each found his couch of repose and refreshment, the doctor must spend many hours of the night in study, making patient research in preparation for successful work in his high and noble calling. His duties and anxieties come ultimately to classify him. He needs no badge. Gentlemen, we recognize you. (Applause.)

One other remark: The gavel which I hold in my hand is made of hickory-wood. It is part of a log which was part of the house in Highland County, Ohio, in which, September 14, 1843, Dr. Alexander Dunlap, of Ohio, made his first ovariotomy. Dunlap, as you all know, was the pioneer in this work in Ohio—for that matter, in the world. This historic gavel was handed to me by our distinguished Fellow Dr. Edwin Ricketts, of this city. It is quite fitting, Mr. President, that you should wield it and lay it by the side of that other noted gavel owned by the Society and made from part of the table used in his office for fifteen years prior to his death by the immortal Sims. Mr. President, on behalf of Dr. Ricketts, I present you now with this gavel. (Applause.)

You will see that we have secured for your sessions this most convenient and well-adapted hall within this magnificent

and homelike hotel. Our young men of the Academy and of the Obstetrical Society have arranged midday luncheons for each day. The local resident Fellows will banquet you at the Queen City Club on Thursday night. Welcome! Welcome! (Loud applause.)

RESPONSE BY THE PRESIDENT.

Gentlemen: On behalf of the Association and its guests, I desire to extend our most profound thanks to Dr. Reamy for his beautiful and eloquent address of welcome. This Association has looked forward to this occasion for a very, very long time. We have always considered Cincinnati in our territory, for some of our best members resided here in the early history of the Association. While it is well known that the Association accepts members who do not reside in the South—and I mean by members, as Dr. Reamy has stated, the leading men in our profession—it is understood that the meetings of the Association shall be held in the South only. This Association was formed to give the South what has been enjoyed by the North and East—a special society for the advancement of the science of surgery and gynecology. When this Association was formed the South was poorly represented in the national special societies. Now, I may say to you, it is largely represented; almost every prominent man in the South has membership in one of these societies. So the Association has been of value in giving the South recognition in this country as well as abroad. (Applause.)

I was glad to hear Dr. Reamy say what he did of the medical profession of this country. There was never any real division of the medical profession. It was the medical profession that first tried to bring the sections together. It was Dr. Baldwin who, when the profession was invited to unite in a national organization, advised it to do so. It was one of the first movements of reunion which bound us a country in which Alabama and Ohio come as one.

I wish to extend to Dr. Reamy our profound thanks for this gavel. We honor these great and good men (Sims and Dunlap) as members of the greatest profession the world has ever known. (Applause.)

REPORT OF THE COMMITTEE OF ARRANGEMENTS.

Gentlemen: The Committee of Arrangements has arranged the following list of entertainments:

Tuesday evening, at nine o'clock, a smoker will be given at the Grand Hotel by the local profession represented by the Academy of Medicine, to which all members of the Association, all visiting physicians from abroad, all the local physicians of the city are invited. This is the time for a regular good handshake informally and to see everybody.

On Wednesday evening a banquet to the Association will be given by the local members of the profession, at the Queen City Club. Every member of the Association has received the regular invitation to that dinner or the mail failed to deliver the invitation of the Committee to you. If there is any member present who did not receive that invitation, he will be supplied with the ticket by the local committee if he will make the fact known to Dr. Dandridge, Dr. Reed, Dr. Ransohoff, or myself. Any local members of the profession who may be here or friends of yours whom you may have an opportunity to meet and who have not been informed, who may wish to attend that banquet at the Queen City Club, will have an opportunity of doing so by securing tickets at the Queen City Club any time to-day, but as early as possible. The fee for the ticket for such persons is eight dollars. To all other persons, of course, it is complimentary.

Wednesday noon, twelve o'clock, there will be a luncheon given at the Grand Hotel by the Cincinnati Obstetrical Society, to which all the members of the Association and visiting members are invited.

Thursday noon a luncheon will be tendered to the Association and the visiting physicians and to the profession of Cincinnati by Drs. Edwin and B. M. Ricketts at their residence, northwest corner of Fourth and Broadway.

Now, Mr. President, it is my pleasure to turn this meeting over to your hands. This Association is one, we have observed, that is eager to go at once to work, and you will observe that a paper will be read at once, in two or three minutes after I take my seat, and an able one. (Applause.)

On motion, the report of the Committee of Arrangements was adopted.

Papers were then read as follows:

1. "The Present Status of Treatment of Hypertrophy of the Prostate," by Dr. N. P. Dandridge, of Cincinnati, Ohio.

Discussed by Drs. Ferguson, Young, and, in closing, by the essayist.

2. "Conservative Operations Upon the Ovary," by Dr. L. H. Dunning, of Indianapolis, Indiana.

Discussed by Drs. Noble (Geo. H.), Byford, Manton, Engelmann, Earnest, Cartledge, Douglas, Walker, and the discussion closed by the essayist.

3. "Cysts of the Pancreas, with Report of Cases," by Dr. A. M. Cartledge, of Louisville, Kentucky.

Discussed by Drs. Mayo, Dunning, Douglas, Ferguson, and the discussion closed by the essayist.

On motion, the Association adjourned until 2.30 P.M.

Afternoon Session.—The Association reassembled at 2.30 P.M and was called to order by the President.

On motion, the local members of the medical profession and other visitors were invited to participate in the discussions on papers.

4. "The Curse of Gonorrhœa," by Dr. Joseph Taber Johnson, of Washington, D. C., which was discussed by Drs. Hardon Dudley, Boldt, Young, Morris, Noble (Chas. P.), Sherrill, Ferguson, and the discussion closed by the essayist.

5. "Movable Right Kidney and Appendicitis," by Dr. Walter P. Manton, of Detroit. Michigan.

Discussed by Drs. Saunders, Walker, Morris, Noble (Chas. P.), Ferguson, Kramer, Mayo, McAdory, and the discussion closed by the essayist.

6. "Perineorrhaphy, Illustrated," by Dr. George H. Noble, of Atlanta, Georgia.

Discussed by Dr. Noble (Chas. P.), and, in closing, by the essayist.

On motion of Dr. Haggard, the Association adjourned until 9.30 A.M., Wednesday.

SECOND DAY.—*Wednesday, November* 12, 1902.

Morning Session.—The Association met at 9.30 A.M., with the President in the Chair.

7. "Pregnancy and Parturition following Complete Nephro-

Ureterectomy," by Dr. J. Wesley Bovée, of Washington, D. C.

The President appointed as a Committee to audit the accounts of the Secretary and Treasurer Drs. Bacon Saunders, Edwin Walker, and Hugh M. Taylor.

The discussion on the paper of Dr. Bovée was then proceeded with. The paper was discussed by Drs. Douglas, Boldt, Noble (Chas. P.), Ricketts, Porter, Carstens, and the discussion closed by the essayist.

8. "Surgery of the Lower Ureter," by Dr. Hugh H. Young, of Baltimore, Maryland.

Discussed by Drs. Mayo, Noble (Chas. P.), Bovée, Ferguson, and the discussion closed by the essayist.

9. "Personal Experience with McGraw's Method of Gastro-enterostomy," by Dr. Samuel Lloyd, of New York.

Discussed by Drs. Richardson, Mayo, Manton, and the discussion closed by the essayist.

At this juncture the President's address was delivered by Dr. W. E. B. Davis, of Birmingham, Alabama, with Dr. Bovée occupying the Chair.

On motion of Dr. Hall, of Cincinnati, a vote of thanks was extended to President Davis for his interesting and able address.

On motion, the Association adjourned until 2.30 P.M.

Afternoon Session.—The Association reassembled at 2.30 P.M., and was called to order by the President.

Dr. Engelmann moved that the most excellent recommendations contained in the President's address be referred to the Council for action. Carried.

10. "Indications for Extirpation of the Gall-bladder and Technique of the Operation," by Dr. Maurice H. Richardson, of Boston, Mass.

Discussed by Drs. Mayo, Carstens, Morris, Porter, Dudley, Ricketts, Ferguson, McGannon, and the discussion closed by the essayist.

11. "Anterior Transplantation of the Round Ligaments for Uterine Displacement," by Dr. Alexander Hugh Ferguson, of Chicago, Ill.

12. "Intramural and Extraperitoneal Anchorage of the Round Ligaments for Backward Displacement of the Uterus," by Dr. George H. Noble, of Atlanta, Ga.

13. "Intra-abdominal Shortening and Anterior Fixation of

the Round Ligaments for Posterior Uterine Displacements; Preliminary Report Concerning Technique, with Report of Cases," by Dr. F. F. Simpson, of Pittsburg, Pa.

These papers were discussed jointly by Drs. Byford, Noble (Chas. P.), Boldt, McGannon, McGuire, Dudley, Ferguson, and the discussion closed by the essayists.

14. "Gas Bacillus Infection, with Report of Cases," by Dr. Robert T. Morris, of New York City, N. Y.

Discussed by Drs. Ferguson, Bovée, Richardson, Young, and the discussion closed by the essayist.

15. "Prolapse of the Uterus," by Dr. Charles R. Robins, of Richmond, Va.

Discussed by Dr. Boldt.

On motion, the Association adjourned until 9 o'clock, Thursday.

THIRD DAY.—*Thursday, November* 13, 1902.

Morning Session.—The Association met at 9.30 A.M., and was called to order by the President.

16. "(*a*) Disease of the Ribs Following Typhoid Fever; (*b*) A New Holder for Gigli Saws," by Dr. J. Shelton Horsley, of El Paso, Texas.

Discussed by Drs. Vance, Martin, Price, Young, and the discussion closed by the essayist.

17. "Stone in the Kidney," by Dr. Mack Rogers, of Birmingham, Alabama.

18. "Hæmaturia," by Dr. H. C. McGannon, of Nashville, Tenn.

Discussed by Drs. Earnest, Oviatt, Price, Boldt, Noble (Chas. P.), Fort, Martin, Rogers, and Young.

19. "Endometritis," by Dr. Hermann J. Boldt, of New York City, N. Y.

The report of the Auditing Committee was then presented, as follows:

The Auditing Committee have examined the books and accounts of the Secretary and Treasurer, and have found them correct and accompanied by proper vouchers. The total collections for the year amounted to $1680; balance in treasury, $3182.48.

Respectfully submitted,

BACON SAUNDERS,
HUGH M. TAYLOR,
EDWIN WALKER.

On motion, the Report of the Auditing Committee was adopted.

The Secretary then read the report of the Council, as follows:

REPORT OF THE COUNCIL.

The Council would respectfully recommend:

1. That the membership of the Association be limited to two hundred.

2. As an additional Article to the Constitution, the Council would suggest the following: All members who have been in continuous membership for twenty years and have attended fifty per cent. of the meetings shall become life members and be exempt from dues.

3. The Council offers the following resolution:

WHEREAS, Dr. W. E. B. Davis, during twelve years of faithful service as Secretary of the Association, declined to draw any salary for his services, expecting in time to establish some suitable memorial of this Association with the fund created thereby; therefore, be it

Resolved, That in consideration of this fact, that two thousand dollars—a sum far less than the salary offered would have amounted to—be appropriated for the establishing of a memorial in Birmingham, Alabama, the birthplace of the Association; and that this memorial be placed in the Charity Hospital of that city as a ward, and to bear the name of the Association.

The Council also recommends that the salary of the Secretary be made $500 instead of $250.

It is recommended that the next meeting be held on Tuesday, Wednesday, and Thursday of the week preceding Christmas, in order to determine the advisability of making this the permanent date of meeting.

As honorary members, the Council nominates: Dr. Thaddeus A. Reamy, of Cincinnati; Dr. J. McFadden Gaston, of Atlanta, and Dr. Richard B. Maury, of Memphis, Tenn.

The following gentlemen are nominated for Fellowship:

Dr. C. L. Bonifield, Cincinnati, Ohio.
Dr. Geo. Wiley Broome, St. Louis, Mo.
Dr. Chas. E. Caldwell, Cincinnati, Ohio.
Dr. Wm. B. Coley, New York City, N. Y.
Dr. Geo. W. Crile, Cleveland, Ohio.

Dr. A. Palmer Dudley, New York City, N. Y.
Dr. Albert H. Freiberg, Cincinnati, Ohio.
Dr. Reese B. Gillespie, Tazewell, Va.
Dr. Barton Cooke Hirst, Philadelphia, Pa.
Dr. Arthur W. Johnstone, Cincinnati, Ohio.
Dr. Wm. Mudd Jordan, Birmingham, Ala.
Dr. Chas. H. Mayo, Rochester, Minn.
Dr. W. P. McAdory, Birmingham, Ala.
Dr. Lewis C. Morris, Birmingham, Ala.
Dr. M. W. O'Brien, Alexandria, Va.
Dr. John Chadwick Oliver, Cincinnati, Ohio.
Dr. Chas. W. Oviatt, Oshkosh, Wis.
Dr. J. Garland Sherrill, Louisville, Ky.
Dr. Magnus A. Tate, Cincinnati, Ohio.
Dr. Horace J. Whitacre, Cincinnati, Ohio.
Dr. E. Gustav Zinke, Cincinnati, Ohio.

OFFICERS.

The Council nominates for President, Dr. J. Wesley Bovée, of Washington, D. C.; First Vice-President, Dr. Bacon Saunders, of Fort Worth, Texas; Second Vice-President, Dr. Christopher Tompkins, of Richmond, Va. (The Secretary and Treasurer hold over.)

For the Council: Dr. W. E. B. Davis, of Birmingham, Ala.

Place of meeting, Birmingham, Alabama.

Chairman of Committee of Arrangements, Dr. John D. S. Davis.

Dr. Boldt moved that the Secretary be authorized to cast an affirmative ballot for the nominations made by the Council, and that the recommendations of the Council be adopted. Carried.

The Secretary then cast the ballot of the Association for the various recommendations of the Council and nominations for officers and new members, and they were declared duly elected.

The President appointed Drs. Noble and Engelmann to conduct the newly-elected President to the Chair.

Dr. Bovée, the newly-elected President, was received with applause. He said:

Fellow Members of the Association: This is a pleasure that I did not even dream of. I have always been a worker in the ranks, or tried to be, in my humble way, and while I do not like

to cast any discredit upon the judgment of the Council in nominating me for the Presidency of this Association, I will say that I greatly and highly appreciate the honor conferred upon me, and with your valuable assistance will try to make our next meeting in Birmingham one of great interest, not only to our Association, but to the medical profession of the country. (Applause.)

The paper of Dr. Boldt was then discussed by Drs. Dudley and Johnson, and the discussion closed by the essayist.

20. "The Use of the Electric Cautery Clamp in the Treatment of Cancer of the Uterus," by Dr. Charles P. Noble, of Philadelphia, Pa.

Discussed by Drs. Haggard, Engelmann, Reamy, McMurtry, Price, Boldt, Ferguson, and the discussion closed by the essayist.

The following papers were read by title:

1. "Drainage," by Dr. S. J. Mixter, of Boston, Mass.

2. "Restorative Surgical Treatment of the Uterine Appendages," by Dr. Charles A. L. Reed, of Cincinnati, Ohio.

3. "Surgical *versus* Medical Treatment of Cholelithiasis," by Dr. John B. Deaver, of Philadelphia, Pa.

4. "Report of a Successful Case of Uretero-ureteral Anastomosis," by Dr. Geo. Ben Johnston, of Richmond, Va.

5. "The Significance of Paralysis of the Bowel," by Dr. Geo. S. Brown, of Birmingham, Ala.

6. "Pylorectomy for Malignant Obstruction Followed Two and a Half Years Later by Gastro-enterostomy," by Dr. W. W. Taylor, of Memphis, Tenn.

7. "The Treatment of Posterior Uterine Displacements," by Dr. Edward McGuire, of Richmond, Va.

8. "Carcinoma in the Female," by Dr. Willis F. Westmoreland, of Atlanta, Ga.

9. "Tubercular Peritonitis," by Dr. John B. Murphy, of Chicago, Ill.

10. "The Sequelæ of Appendiceal Operations and Repeated Operations," by Dr. Joseph Price, of Philadelphia, Pa.

11. "Some Autopsy Findings in Cases of Stillborn Children," by Dr. C. Jeff. Miller, of New Orleans, La.

12. "Fracture of the Spine; Three Cases," by Dr. Howard J. Williams, of Macon, Ga.

13. "Notes on the Operative Treatment of Fractured Patella," by Dr. Rudolph Matas, of New Orleans, La.

14. "A Study of Adrenal Growths; Report of Three Cases of Adenoma," by Dr. J. E. Thompson, of Galveston, Texas.

15. "Unilateral Disease of the Kidney, Simulating Stone, and its Treatment," by Dr. Joseph Ransohoff, of Cincinnati, Ohio.

16. "What is the Limit of Safety Where More than One Operation is Necessary?" by Dr. A. Vander Veer, of Albany, N. Y.

17. "Dependent Drainage in Acute and Extensive Intrapelvic and Intraperitoneal Infection in Men by Incising the Peritoneum Separating the Rectum from the Prostate and Bladder, and Puncture of the Rectovesical Pouch of the Peritoneum," by Dr. Hugh M. Taylor, of Richmond, Va.

18. "Some Points in Vaginal Hysterectomy," by Dr. T. J. Crofford, of Memphis, Tenn.

19. "Condylomata Vulvæ," by Dr. Greer Baughman, of Richmond, Va.

20. "Multiple Fistulæ of the Perineum," by Dr. Wallace Neff, of Washington, D. C.

21. "Spinal Analgesia," by Dr. E. Denegre Martin, of New Orleans, La.

22. "Report of a Successful Operation for Typhoid Perforation," by Dr. W. D. Haggard, of Nashville, Tenn.

On motion of Dr. Joseph Taber Johnson, votes of thanks were extended to the Committee of Arrangements for making the meeting a social and pleasant success; also to the proprietors of the Grand Hotel for the commodious and beautiful room in which the sessions were held, and to other gentlemen in Cincinnati for entertaining the members at their private residences, at luncheons, etc.

On motion, the Association then adjourned, to meet in Birmingham, Alabama, on Tuesday, Wednesday, and Thursday of the week preceding Christmas, 1903.

W. D. Haggard, M.D.,
Secretary.

The Association does not hold itself responsible for the views enunciated in the papers and discussions published in this volume.

W. D. HAGGARD, M.D., *Secretary*,
NASHVILLE, TENN.

NOTE.

At a meeting of the Council in New Orleans, May 5, 1903, Atlanta, Ga., was selected as the next place of meeting in lieu of Birmingham, Ala.

Headquarters: Piedmont Hotel.

Date: December 15, 16, 17, 1903.

Chairman of Committee of Arrangements: Dr. W. F. Westmoreland.

W. D. HAGGARD, M.D.,
Secretary.

ANNUAL ADDRESS OF THE PRESIDENT.

By W. E. B. Davis, M.D.,
Birmingham, Ala.

I desire, first of all, to express my profound appreciation for the distinguished honor you did me at our last meeting, in elevating me to the highest position in your gift. The Association's history is one of brilliant achievements, which are to-day recognized throughout the world. You will not consider it inappropriate, I am sure, for me to discuss the early history of the Association and the events immediately preceding the perfection of the organization.

In November, 1886, a few prominent physicians of Birmingham met in the office of the *Alabama Medical and Surgical Journal*, of which my brother, J. D. S. Davis, and I were editors, for the purpose of organizing the Alabama Surgical and Gynecological Association. As a result of this conference a meeting for permanent organization was called for December 15, 1886. There were invited to this meeting fifty of Alabama's leading men, some of whom did not do a great deal of surgery and gynecology, but who were prominent physicians, and whose influence it was thought would be of great service to the organization. The attendance at the meeting for permanent organization was fairly good and letters were received from those who could not attend signifying their sympathy for such an organization and their desire to become members. Dr. H. N. Rosser, of Birmingham, was elected President and I was made Secretary.

The *Alabama Medical and Surgical Journal,* in its editorials, urged the necessity of the organization for the development of these departments in the State. It was insisted that this Association would not in any way conflict with the Medical Association of the State of Alabama, as its work was entirely scientific and would in no way have to do with the State's ethical and sanitary affairs. I herewith quote from an editorial in the December number (1886) of the *Alabama Medical and Surgical Journal:*

"The Association will be organized in Birmingham on the 15th of December, and will have purely for its object the advancement of surgery and gynecology in the State. It will have nothing to do with the medical laws and ethics of the State, but will leave these for the State Medical Association, which it will endeavor to help in the great work it is doing in the organization of the profession of Alabama.

"The Alabama Surgical and Gynecological Association will in no way whatever conflict with the State Medical Association, but will be composed of some of its best members, who will do good work in both societies. It will be organized for scientific purposes and will conflict with no association now in existence. It will be the aim of its charter members to make it an honor for any physician to hold its certificate of membership. It will afford a field for active workers in the departments of surgery and gynecology never before enjoyed by Alabama physicians.

"The Alabama Medical Association affords opportunity for some general work in these departments, which is very good so far as it goes, but is too limited. This Association will expect its members to study these departments as sciences, and to be able to add something to our already rich store of knowledge. To the Alabama State Medical Association is due the honor for the almost perfect organization of the profession of the State, and to keep this organization complete, with some general work, is enough for one society. It generally requires most of its sessions

to hear the reports from the sub-organizations of the State. This Society will have nothing to do with this class of work, but its time will be entirely devoted to the reading and discussion of papers pertaining to surgery and gynecology.

"The committee has invited only fifty members to take part in the permanent organization of the Association, as it was thought that the requirements for membership and the plans for its future success could best be formulated by a few active men.

"The success of the Association is assured, and we trust that it will receive the sympathy and co-operation of the profession of the entire State."

At the meeting for permanent organization a dozen of the leading surgeons of the State were elected honorary members, with a view to the formation of a Southern organization later with these distinguished men as a nucleus. Some of these advised that the Southern organization be formed at once, but I expressed the opinion that I thought the Southern States needed, for several years, such organizations as the Alabama Surgical and Gynecological Association, so as to develop suitable material for the larger and more exclusive body. I further stated that we had very, very few men in Alabama who would be eligible to membership in such a society. It was my opinion that the State organizations should continue intact and that the more distinguished members should be elected to membership in the Southern Association. They would not sever their relations with the State special societies, but on the contrary, would be more active in their work for the State organizations so as to develop worthy material and thus furnish members later for the larger organization.

As mentioned, it was deemed best to have a State organization for some length of time, in order to bring into prominence a larger number of men in these departments. The Alabama Association began most auspiciously, having the leading men of the State, with but few exceptions, on the roll of membership.

The early extension of the Alabama Association into the Southern Surgical and Gynecological Association was due entirely to Dr. Jerome Cochran, of Alabama. He was the greatest medical organizer, perhaps, the world has ever known, and had already made the State Medical Association of Alabama the model State organization of this country. It had not been fully appreciated by the American profession at that time, but, as you all know, is now being very largely copied and quoted as a model for the organization of the profession of our entire country. He apprehended trouble from the new organization and at once began to discourage its support by these excellent men, who, with but very few exceptions, were already strong supporters of the Alabama Medical Association. Unfortunately for the new Association, its President, Dr. Rosser, was not regarded by Dr. Cochran as in full sympathy with the old Association. Dr. Cochran was also suspicious of the editors of the *Alabama Medical and Surgical Journal*, because they differed with him on some important points in connection with the management of the State Medical Association, notwithstanding the fact that the editors had expressed themselves so fully in sympathy with the organzation and had in every way demonstrated their loyalty to it. However, Dr. Cochran could not tolerate differences of opinion. He regarded the man who differed with him as his enemy always. Particularly was this so in regard to matters pertaining to the Alabama Medical Association. It was because we advocated examinations by a State Board instead of by County Boards,which were deficient then, and will always be deficient, and also advocated doing away with examinations by the State Board of applicants who are not medical graduates, that lost us his confidence. He wrote to many of the members discouraging their co-operation in the new organization, and when I returned, in July, 1887, from a trip abroad, having been absent six or seven months, I found a large number of the members of the Association rather indifferent as to the success of the new

organization. I was at once impressed that it would be impracticable to accomplish much in Alabama with such an Association with Dr. Cochran against it, as he had the Alabama Medical Association so well in hand, having devoted his entire time to it for many years, not doing any practice whatever. Few, ambitious for position in the Association, would dare go against his will. Those who have studied the organization will understand how completely it could be made a one man's power by his devoting his entire time to that end, and especially if he had a giant mind such as Dr. Cochran's.

When it was decided by some of the leaders of the Alabama Association to extend the organization, the honorary members were conferred with and they, with but few exceptions, approved of the plan. I remember that Dr. Yandell wrote me that he thought the union would prove rather an unsatisfactory one, as the general surgeon would not enjoy listening to a gynecologist discuss dysmenorrhœa, and the gynecologist would have very little interest in the treatment of a fracture of the thigh. Yet with so great a surgeon speaking disparagingly of it—and this was the first association where the surgeons and gynecologists were combined in this way—its name has anticipated what may be expected in the future. Indeed, purely gynecological societies will prove less frequent with each recurring year. After conferring with a large number of the members of the new organization, a letter signed by the President and Secretary was sent to the representative men throughout the South, inviting them to attend the approaching meeting of the Alabama Surgical and Gynecological Association, October 11 and 12, 1887, with a view of forming the Southern Surgical and Gynecological Association. They were asked to express their opinion of such an organization and to signify whether they would be willing or not to be placed upon its roll of members. There were about eighty favorable replies to these letters. Among those who expressed very great enthusiasm to see the organization a truly representative

Southern special society was Dr. W. D. Haggard, of Nashville, the father of our Secretary. He was very active in his efforts in behalf of the proposed organization. Indeed, his services were of inestimable value in the early history of the organization.

At the meeting of the Alabama Surgical and Gynecological Association, which convened in Birmingham, October 11, 1887, a fairly good programme was carried out, and on the second day of the meeting the question of the formation of the Southern Association was brought before the body. There were only a few outside of Alabama present. Among them were Drs. W. D. Haggard, of Nashville; W. F. Hyer, of Holly Springs, Miss.; and J. S. Cain, of Nashville. Yet the Secretary had in his possession, as has been stated, letters from about eighty representative men, signifying their desire to have their names placed upon the roll of membership of such an association. Accordingly, the organization was perfected on October 12th. Dr. W. D. Haggard was elected President and I was made the Secretary. Dr. J. S. Cain, of Nashville, was elected Chairman of the then Judicial Council. The ablest men in the South, although absent, were elected to fill the other places on the Council and were wired for their acceptances, and they promptly responded in the affirmative. Birmingham was selected as the next place of meeting, and the second Tuesday of November, 1888, as the time for the same; but on account of yellow fever in the South, the meeting was held on December 4th, 5th, and 6th. Recurring to the meeting for permanent organization, a Committee was appointed, of which the Secretary was made Chairman, which was empowered to solicit suitable members for the Association during the time intervening until the first regular meeting. This Committee was empowered to place those who accepted membership and paid their dues on the roll as Founder Members of the Association. When the meeting was held the Association had enrolled about ninety members. Unfortunately for the organization, all of the members of the

Alabama Association who desired to go into the Southern Association were permitted to do so. This necessarily admitted some members who should not have been received into the enlarged organization. It took several years to overcome this unfortunate complication.

It was the ambition of a number of the members to have this Association patterned after the American Gynecological Society as far as possible. Hence, it had great obstacles to overcome, inasmuch as there were so few men in the South of great reputation compared with the cities of the North and East, and inasmuch as we had already received some men who were not eligible to membership in such an organization. This problem had to be dealt with very delicately and tactfully, so as to allow the undesirable members to be eliminated without any notable friction. This will explain why, for a number of years, the names of those who resigned or died were not published in the TRANSACTIONS. It would have been peculiarly unfortunate to have had the sketch of the life of an unknown man in Alabama appear in the TRANSACTIONS, which would have been read by many eminent surgeons who would have judged the Association by this example. However, by tact on the part of the Council and Secretary these men have gradually disappeared from the roll, having been dropped as a rule for non-attendance or the non-payment of dues, there being a By-law which provides that "a member who fails to attend for three consecutive meetings shall be dropped from the roll," and another, "that a member failing to pay his dues for one year shall be dropped.".

It was soon ascertained that there were not enough surgeons residing in the South, of reputation and ambition to attend such meetings, who could be gotten in sufficient numbers for a successful session, except in two or three cities of the South, and the Secretary urged the Council to invite men of great eminence from the entire country to join the Association. It was argued that they would constitute an inspiration for the Southern men and assist in

making our meetings more successful. Good men in the South who had not been known before and whose reputations would not have admitted them to the national special societies, met these men from other sections of the country, and as a result the majority of the deserving men of the South are now members of some of the national special societies.

The meeting in Birmingham proved to be quite successful, and while the Association had not provided an official stenographer the papers formed a most excellent volume of TRANSACTIONS. Dr. Hunter McGuire was not in attendance, but having expressed his hearty sympathy for the organization, the members present decided that he was the man to place at the head of the organization, and accordingly he was elected President—having previously signified his willingness by telegram to accept the office. When it became known that Dr. McGuire had accepted the Presidency and was in sympathy with the organization its success seemed fully assured.

The second meeting, which was held in Nashville, under his Presidency, was a splendid success, and the discussions were reported in a superb manner by Dr. Wm. Whitford, who has been our official stenographer ever since. The volume of TRANSACTIONS of this meeting was one of the most handsome of the special societies of this country, and was complimented alike by the journals of the North and South. Indeed, there were favorable expressions in foreign journals of this splendid new organization. Dr. George J. Engelmann was elected President to succeed Dr. McGuire, and the Atlanta meeting under his Presidency was a most successful one. On this occasion, among the notable Southern men present were Drs. Henry F. Campbell and Robert Battey. I am sorry to have to say that Dr. Battey was one of the very few men of national reputation in the South who failed to join the organization. It so happened that this Association and the American Association of Obstetricians and Gynecologists were organized the same year,

and as the American Gynecological Society looked with suspicion upon anything gynecological that was organized at that time, this accounted for Dr. Battey's remaining out of the Association. When he was President of the Tri-State Medical Society of Alabama, Georgia, and Tennessee, which met in Chattanooga in 1891, we dined together, and he told me that it was because the members of the American Gynecological Society had felt the necessity of fostering their strength that he had withheld his name from this Association.

We invited as members, first, all the Fellows who resided in the South of the American Surgical Association and the American Gynecological Society. These we regarded as a splendid nucleus around which to build. It was for this reason, as stated above, that these same men were elected honorary members of the Alabama Association when that organization was formed, that they might be in sympathy and of service in the enlarged organization. Some of these were never very enthusiastic, and I am sorry to say did little active work to help the young organization struggling for existence. However, their names on the roll of members were of inestimable service. I felt then as I feel now, and as I wrote Dr. Kinloch when he resigned several years before his death, that these men, even though they might not be benefited by holding membership, owed it to the South to lend their names and influence to an association which had for its purpose the development of these departments in the South and the bringing forward of worthy men who otherwise would have remained unknown in all probability. I am glad to be able to say for them that they, with two or three exceptions, did not withhold their names. Some of them who were very indifferent in the early history of the Association, later became enthusiastic members. They should not be censured for having looked with suspicion on the organization at first, inasmuch as it received so many members who were not eligible for membership in such an association. They could not know then

that we would so soon eliminate the objectionable features and make the Association in every way one of the foremost special societies in the country.

There arose considerable prejudice in the South in 1886 against such an organization as was proposed, as is illustrated by an editorial in one of the leading journals of that year. In the spring of 1886, the Association of American Physicians was organized, and the editor of one of the most prominent journals of the South, one that was largely copied and quoted throughout the South, criticised its members very severely for calling it "*The American Association,*" when its membership had been limited to one hundred, and inasmuch as they were, with few exceptions, from New York, Boston, and Philadelphia. The prejudice was against the assumption of so great a name for so small an organization. Indeed, it was a question how the Southern Association should be broached without being met with a number of denunciatory editorials. In order to overcome this prejudice and the previously expressed opinion in regard to such an organization, no mention of limitation of membership occurred in the letter which was sent out inviting the members of the profession to join the Association, and furthermore, to the leading editors there were written personal letters inviting them to attend the meeting as the special guests of the Association. The Secretary also took great pains to write them fully and repeatedly in regard to the meeting, emphasizing the great need in the South of such an organization. Without an exception they appreciated the situation and advocated its purposes in strong terms. Some of them were not in a position to pay for special reports of the meetings, and for two or three years the Secretary had this done at the Association's expense, so that the proceedings might be adequately distributed throughout the South. These Southern journals have been the mainstay of the Association, as will be abundantly testified to by those who have been most active in the carrying on of the work of the organization.

I was very much amused when a distinguished editor of one of our best and oldest journals, in 1887, wrote me that one hundred men could not be found in the South who would pay ten dollars annual dues. I wrote him that we had more than that many in Alabama who would do so, and if the honor were made great enough they would pay one hundred dollars dues. It all depended upon how much value was placed upon membership. In this connection I may say that Dr Jerome Cochran, when he saw that the Association had succeeded and realized that I had been loyal to the State Association, became not only my friend, but a supporter of the Southern Association.

Dr. E. H. Sholl, who is one of Alabama's greatest physicians and noblest of men, who gave his undivided support to the organization in its early history, when it most needed help, at the New Orleans meeting, Dr Cochran being present, in speaking of Dr. Bedford Brown's Presidential Address, said:

"I stand with amazement as I see before me so many brilliant men who have taken the deepest interest in this Association. One of its beautiful and striking features is that it ignores any limitation of latitude. It is recognized at all times and on all occasions, and characterized by the unity and harmony of our glorious profession, full-orbed in its type and vigorous manhood. Already in its sixth year of existence, it is not only a recognized factor in the South, but it meets with the approval of our distinguished brethren of the North and West, who are participating in its proceedings, who are helping to bring it to the front, making it one of the greatest associations of its kind in the United States. I say this unhesitatingly, because its work has been recognized both at home and abroad. I call to witness Dr. Jerome Cochran, by whose side I have labored for so many years, to testify to this fact, that it has been an inspiration everywhere in the work of our own State. It has been a kindred movement which has impelled us in a new line. In the great work Dr. Cochran has done in the

development of quarantine, we have stood by his side; we have worked with him with unity of purpose. I am proud to say that this Association knows no North; but it recognizes a broad, intellectual grasp in its researches."

The address of Dr. Bedford Brown dealt with the Association as it was in its sixth year of existence. Dr. Brown was not present at the meeting for permanent organization. Its founders did not desire that it should embrace the classes of membership he so fully and ably set forth. This condition obtained because, as I have already explained, the Association was the Alabama Association enlarged, which necessarily carried with it the classes of members referred to.

Recurring again to the prominent surgeons and gynecologists of the South at the time the Association was formed, I desire to say that their names and influence enabled the Association to occupy the position in the South to which it aspired—without this support it would certainly have failed. Too much honor cannot be done Haggard, McGuire, Bedford Brown, and Kollock, ex-Presidents of the Association, who have gone to their reward. Suitable sketches of their lives should be published in the TRANSACTIONS of this year and engravings should be made from the best photographs obtainable. In this volume I would also request the same for Yandell, Briggs, Mastin, Campbell, Westmoreland, Kinloch, Michel, Miles, and Rohé.

Since our last meeting death has claimed one of our most beloved members. He was esteemed by us all; I refer to Dr. James T. Jelks. I would suggest that the Secretary have prepared for the present volume of TRANSACTIONS a suitable sketch of his life.

The Association for several meetings had memorials presented of the lives, etc., of a number of the South's most illustrious sons, but the TRANSACTIONS do not furnish likenesses of these men. Would it not be well to secure good photographs and have cuts made for this volume. Under each picture suitable reference should be made as to the

volume in which the memorial address is published. Such addresses have been read on the lives of McDowell, Dudley, Stone, Sims, and Paul F. Eve. It is probable that cuts could be procured from their families without cost to the Association.

I would also recommend that a suitable sketch of the life of Robert Battey be procured for the next volume of the TRANSACTIONS and that it be accompanied with a good engraving.

When the Association was organized it was deemed advisable that there should be but one class of membership, but after seven years it decided to have honorary members. I now desire to recommend that we have another class of membership to be known as Life Members. They are to have all the privileges of ordinary members and are to be exempt from dues. I would advise that the following classes of members be eligible for consideration by the Council for this honor, provided they are men of great eminence in the profession:

1. Those who have been members twenty years and have attended 50 per cent. of the meetings.

2. Those who are more than sixty-five years of age.

I desire to recommend Dr. J. McF. Gaston, of Atlanta, an ex-President of the Association, and a man who has won great distinction in the profession; Dr. R. B. Maury, of Memphis, who was a devoted member of the Association in its early history and who is well known for his high position in the profession, and Dr. Thaddeus A. Reamy, of this city, one of the most distinguished gynecologists of America and a devoted member of the Association, for this class of membership. They are all more than sixty-five years of age, and have ceased doing very active practice.

When Dr. Haggard was elected Secretary, I recommended that his salary be made $400, but the majority of the Council thought that $250 would be sufficient. I want again to insist that the Secretary's salary be increased. Indeed, it is my opinion that we should not pay him less

than $500. In the language of Dr. Joseph Taber Johnson, who has had great experience as Secretary of one of the best societies of America: "The members of a society scarcely realize the amount of work which is represented by the finished programmes and volumes of transactions which reach them through the mail. The ordinary notices of the place and time of meeting, the solicitations of members to write papers, their orderly and systematic arrangement in groups, their assignment to particular days and hours to suit the wish or convenience of their authors, the preparation for the printer and the subsequent interviews with that important personage, the large correspondence, his necessary and prompt attendance at all the meetings of the society and of its council, the reconciling of many conflicting interests, the securing of the papers in proper form for the printer from their frequently dilatory authors, the editing of the discussions, and, finally, of the entire volume of transactions in the very creditable and elegant shape in which it finally reaches us." Our Association is peculiarly fortunate in having so able a Secretary and one who takes so deep an interest in everything pertaining to its affairs.

At the beginning, the Association insisted on paying me for services as Secretary, but I declined to accept such salary, and only received a small amount, scarcely sufficient to cover necessary expenses. It was my ambition to save a considerable sum and publish a memorial volume for the Association on abdominal surgery. However, this was found to be impracticable, as it would have caused some members to feel slighted, and thus factions would have been created in the Association. I then desired to see some sort of a memorial built in Birmingham, the birthplace of the Association. However, the funds of the Association have never been sufficient to justify this. I now desire to recommend to the Association that it requests the City and County Hospital, which will be built in Birmingham during the coming year, to name the ward for the surgical diseases

of women, The Southern Surgical and Gynecological Association Ward. I would also ask the Association to request the Hospital to name the negro gynecological ward for Marion Sims, inasmuch as his great work was done in Alabama and on negro women. I make these requests as I am confident the Board of Managers of the Hospital would gladly grant them.

Some years ago the Association limited its membership to one hundred and fifty. I would suggest that the limitation of membership now be made two hundred, and that only such men as would be eligible for membership in the leading national special societies be regarded as eligible to this Association. No greater mistake can be made than in taking men of immature age and professional experience. These men often turn out badly and the prestige of the Association is destroyed in their cities and often in the entire State in which they live.

We want the Association to continue to hold its meetings in the South and in Cincinnati, and we desire all the great surgeons and gynecologists of this country to join with us in these meetings.

I will again insist upon what I asked for the American Medical Association, in my Presidential Address last year, to the American Association of Obstetricians and Gynecologists. I quote from that address as follows:

"The need of specialism in the profession and of special societies for the promotion of the several specialties have been ably and most exhaustively treated by our foremost men. The national special societies have wielded a wonderful influence in the profession and have added greatly to our reputation abroad. Our medical literature has been enhanced in every way through them. They have been incentives to higher aims and better work in all departments. As individual societies they should be encouraged, but their union into a national congress or association is not conducive to the best interests of the American profession. The greatest and most influential organization of the United

States should be the American Medical Association. Both the specialists and the general practitioners of this country should belong to that Association and take pride in their membership and exert their best energies in behalf of its meetings, as urged by our fellow, Dr. Wright. Many of our ablest men, as claimed by him, have been conspicuous by their absence. Failure to be an active contributor to the work of this national organization should be a justly deserved reflection on a prominent physician, whether he be a general practitioner or a specialist. Several years ago there was some reason for the want of interest in the organization, as there was too much politics and too little scientific work. However, for the past few years the scientific work of the Sections has been of a high order, and a great deal has been accomplished in the time allowed. With the adoption of the new organization providing for the House of Delegates to take charge of all business matters and questions of a judicial or personal nature, more time will be provided for scientific work, the Sections having as many sessions as provided for the meetings of our national special societies. The special societies, composed as they are of leaders in the several specialties, are under obligations to the American profession to assist in the better organization of these Sections. Many of the members of these societies are officers and active working members of the Sections of the American Medical Association and can accomplish this result. There must be one class of membership for the Section that can be held by only those who are recognized as teachers and leaders in order to make membership very desirable and sought after. I would suggest that this class be known as Fellows and that they pay, in addition to the annual dues of the Association, $5 annually for Section dues, which fund should be expended in the publication of the proceedings of the Section. The officers and authors of papers should come from the Fellows. All members would have the privilege of taking part in the discussions and thus an opportunity would be provided for the ordinary

or Association members to show themselves worthy of a fellowship. Such an organization of the Sections with volumes of TRANSACTIONS, publishing a list of the Fellows, would give stability and a permanency to the Section work that could scarcely be had in any other way. With the House of Delegates for the general Association and the Roll of Fellows and Association Members for each of the Sections, we would become the most scientific and influential medical organization the world has ever known."

At a recent banquet to the medical profession, in speaking of the profession of the South and the reasons why many of our best men some years ago had moved to New York and other Northern cities to practice their profession, I said:

"This has been due in a measure to the fact that the fees in the South for professional services have been too small adequately to remunerate them for their services. However, with the South's great increase in wealth this condition should no longer obtain. The public should be educated to know that an operation which involves the life of a patient should be liberally paid for. The total wealth of the South is as much as that of the United States in 1860. The value of our manufactories is now nearly equal to that of the whole country then. Says Mr. Edmondson: 'In the natural resources and advantages for the creation of wealth no other section of the world can equal the South. It has hardly commenced its real development. We have been simply scratching on the ground to find what we have. It produces three-fourths of the world's cotton crop, and yet we have only 7,500,000 spindles out of a total of 106,000,000 in America and Europe. We have more coal and iron than the North, and yet Pennsylvania, smaller than Alabama, has $350,000,000 more capital invested in manufacturing than the fifteen Southern States. In the words of a distinguished Englishman, "It is the Gibraltar of the lights and fuels of the world." No limit can be set to the potentialities of the South.—*Alabama Medical Journal*, October, 1902.'

"It has been said that 'this is the golden age for the medical profession,' and I want to say that the profession of the South has been benefited as much as any other section of this country or abroad.

"It is with pride that I refer to the early achievements of the surgeons of the Southern portion of our country. In the early dawn of the nineteenth century it was sparsely inhabited and patients came great distances to consult the surgeons of reputation. Hundreds of miles would often be travelled on horseback for this purpose. It is with mingled admiration and wonder that we contemplate, in 1809, a woman with a large ovarian cyst travelling on horseback more than sixty miles to Danville, Ky., to have it removed without an anæsthetic by that most remarkable of men, Ephraim McDowell, who thus became the father of abdominal surgery.

"Fifty years later, in a small city in Alabama, plastic surgery had its origin in the invention of the speculum of Sims and in the genius who conceived it and perfected the operation for vesicovaginal fistula. In the language of Haggard: 'You will sustain me when I claim that gynecic surgery with all its brilliant gems owes its present exalted position to the illustrious Sims, no less than abdominal surgery owes its origin to the world-renowned McDowell. They have conferred on the South the honor of being the birthplace of gynecology, and the outcome of their labors has no parallel in the annals of surgery.'

"Thirty years ago pelvic surgery was initiated in a small village in Georgia, and the patient whose ovaries were removed by the vaginal route, still lives in that community. It is true that Robert Battey did not have the correct conception of his operation and had not accepted the pathology as taught by Bernutz and Goupil. Yet his work accomplished the desired results, and our present pelvic surgery is largely the outcome of his operation. What a pity that he failed even to the last to comprehend that his operation was principally indicated for the removal of pathological

conditions and was not a normal ovariotomy. I knew Dr. Battey well. He was a man of remarkable personality and aimed to keep surgery in good repute. His work did not cease until seven or eight years ago, yet he did not attempt very difficult pelvic cases or the removal of fibroid tumors, as his results had been disastrous from such operations and brought his operation into disrepute. He cured many of his cases not by the operation but by the three to six months' hospital care which his patients received. His teachings, however, as to normal ovariotomy led to great harm.

"McDowell, Sims, and Battey were epoch makers in surgery, but there resided in the South a number of other great surgeons. Dudley, of Kentucky, some years after McDowell, did 225 lithotomies with but two deaths, and was equally noted for his general work. After Dudley, Paul F. Eve, of Tennessee, was the acknowledged leader in the South. His fame was so great that he was called to New York to teach surgery. Warren Stone, of New Orleans, became famous for his surgery, and established the first private surgical hospital in this country. Dugas, of Augusta, Ga., and Pope and McDowell, of St. Louis, were well known for their work.

"During and after the war the names of McGuire, of Virginia; Yandell, of Kentucky; Briggs and Rogers, Sr., of Tennessee; Kinloch, of South Carolina; Westmoreland, Sr., and Campbell, of Georgia; Gilmore, Nott, and Mastin, of Alabama; Richardson and Logan, of Louisiana, were well known in surgical history as contributors to surgical literature, and were with few exceptions members of the national special societies.

"Indeed, it has been truthfully said that 'the history of surgery would be incomplete and gynecology unwritten but for these bright stars of the South.' The lives of these men comprise much of the best that is in Southern history, and while they will very soon remain only a memory, yet much of their work has been preserved in the annals of that

remarkable surgical and gynecological organization of the South, the Southern Surgical and Gynecological Association—a fitting organization for a land hallowed by the footprints of these great men.

"The American profession has always been foremost in whatever was good for our country, and after the civil war it was prominent in its efforts to break down the barriers between the sections. It was Dr. W. O. Baldwin, of Alabama, who, in 1868, when the physicians of the South were invited to reunite with the American Medical Association, advised them to accept the invitation, and in the next meeting in Washington he was elected President. At the following meeting, held in New Orleans, he delivered a message as president which filled every reader of its contents with joy and bright hopes for the welfare of our country. It was full of patriotic sentiments so beautifully expressed that it created a sympathetic feeling between the two sections which has continued to increase from that time to this. It was one of the first movements which have bound the North and South so inseparably."[1]

[1] The part of the Address referring to the Southern profession was delivered at the Tri-State Medical Society Banquet in Birmingham in October, 1902. See Alabama Medical Journal, October, 1902.

THE PRESENT STATUS OF TREATMENT OF HYPERTROPHY OF THE PROSTATE.

By N. P. Dandridge, M.D.,
Cincinnati, Ohio.

It is not my purpose to attempt any discussion of the relative merits of the various operations upon the prostate which are now seeking popularity; nor shall I present a description of the well-known pathology of this condition, though I have, by the courtesy of Dr. Whitacre, placed before you his valuable collection on which the changes in the gland and bladder are very fully illustrated. This collection will well repay careful study, and presents very clearly the anatomical and mechanical problem which is presented for solution to the surgeon. It further illustrates a fact contrary to the general teaching, that in a considerable proportion of cases that part of the prostate which lies anterior to the urethra shows very marked overgrowth, an overgrowth in which the characteristic glandular structure is present. This fact is of importance in connection with the Bottini operation.

I may, perhaps, introduce what I have to say upon the present status of treatment of hypertrophy of the prostate by the recital of a case recently operated upon in the Cincinnati Hospital.

P. F., aged seventy years, entered the hospital October 10th, suffering with retention of urine. Every attempt to enter the bladder with a catheter failed, soft and metallic instruments both being tried. He was relieved by aspiration, and twelve ounces of purulent urine drawn off. The

next day attempts at catheterization again failed, but some urine was passed voluntarily. He was kept in bed, the bowels were moved by an enema, urotropin was given by the mouth, and the man succeeded in voiding his urine in the natural way.

The man was of a low grade of intelligence, and no very connected history could be obtained. It was evident, however, from his statement that he had suffered for some years with his bladder, and that the urine had stopped on him a number of times. About three years ago he was operated on in the Good Samaritan Hospital of this city, a perineal section with drainage having then evidently been made, the cicatrix of which was still visible. This gave him relief for a time. Rectal examination showed an enormous hypertrophy, the right side being the more affected. The man's general condition was fair. For some days he was able to void at short intervals small quantities of purulent ammoniacal urine, but it was found impossible to introduce an instrument into the bladder, though this was attempted for the purpose of ascertaining the amount of residual urine. After some days retention again occurred and had to be relieved by aspiration, sixteen ounces only being drawn off. An elbow catheter was finally introduced into the bladder, but it was apparent that no benefit was likely to result from the use of the catheter or from irrigation. Retention again occurred, and he was again aspirated. It was determined, therefore, to perform a prostatectomy, as no operation less radical seemed likely to afford relief, and the man's condition seemed to justify the risk.

The steps of the operation described by Dr. J. W. Murphy, March 22, 1902, in the *Journal of the American Medical Association*, were followed. The man being in the lithotomy position, a Y-shaped incision was made, reaching from the scrotum well down to either side of the anus. The tissues in front of the rectum were then separated by blunt dissection and by the use of blunt-pointed scissors

until the prostate was brought into sight. This part of the operation was attended by a significant amount of hemorrage. Lateral retractors were now used and the prostate fully separated from the rectum. An incision was made parallel to the urethra on the left side, and the lobe was removed by the use of vulsella forceps, sharp-pointed retractors, and blunt dissection. In removal the lobe was torn into several pieces. The right lobe was removed in the same way without being torn, and when freed above and externally was cut away with scissors from the commissure. From the mass of tissue thus removed it was assumed that the whole gland had been brought away, but an examination showed that a still larger mass remained behind. This was grasped on the right side with forceps and was easily shelled out, firm pressure by the hand of an assistant from above being of material assistance.

The removal of this last mass was found to have opened the urethra on its floor. The operation was completed by introducing a Watson tube into the bladder, and the wound was packed with gauze and one side was closed. The man was put to bed, and drainage was secured by a rubber tube attached to the perineal tube. He rallied well, and his improvement has ever since been progressive. The perineal drainage was continued for six days, and then a catheter was carried through the urethra into the bladder. This, however, he refused to tolerate, and, being hard to manage, it was given up. In a few days the urine began to come through the urethra, and the amount has constantly increased—a small perineal fistula only now remaining. At this date the urine is still purulent. It comes almost entirely through the urethra, and is passed more freely and with less pain than for two years. An examination of the masses removed shows an enormous and somewhat irregular hypertrophy affecting all parts of the gland, and no operation short of this complete removal would have removed the obstruction. The

middle lobe showed the greatest overgrowth, and readily explained the difficulty of introducing the catheter. The previous perineal section rendered the separation of tissues in front of the scrotum more difficult.

The impression left by the performance of this operation was that it was a severe one, attended by no insignificant amount of hemorrhage and a very considerable laceration of tissue about the bladder and rectum, and that it required a rather prolonged anæsthesia. Recovery was, however, prompt.

The outcome of this case certainly indicates that we have in prostatectomy a marked advance in the treatment of this most distressing affection, and no other method with which I am familiar could have been followed by so prompt and so successful a result, though it is, of course, too soon to determine how far-reaching and permanent this will be. He now passes water twice at night and four or five times during a day.

It is a matter of suggestive interest, and perhaps of some real advantage, to contrast the evolution of operative work on the prostate and on the ovary. When it was found that the ovary and tube could be successfully removed for other lesions than cystic degeneration, the sound ovary was sacrificed as a matter of course, lest at some time it might also become the seat of disease. Then as a next step the healthy or even apparently healthy ovary was untouched, and the resultant happy motherhood was pointed to by the complacent operator as the result of his forbearance. Then only the diseased portions of the affected organ were removed, and every vestige of healthy structure left in the hope of preserving that mysterious something known as internal secretion. So from the extensive removal of ovary and tube, and even uterus, for local disease of either one, there is now the most painstaking care exercised to save as much as possible. The first surgical attack on the prostate was undoubtedly the accidental removal of the middle lobe by the forceps

in the extraction of stone in lateral lithotomy, an operation whose untimely extinction is still a matter of regret to some of us. Mercier early in the last century devised his method of biting or gouging out a section of the prostate at the neck of the bladder by his rather awkward forceps, an operation which may be said to survive in the more perfect procedure of Bottini, in which the glowing knife will light the way to its ultimate success or failure.

The next step was temporary perineal drainage with a rubber tube, either with or without some incision into the prostate, in order to lower the urethral opening to the level of the bas fond. The suprapubic then came into vogue, for either a permanent or a temporary outlet, and Poncet in an outburst of enthusiasm declared that after this operation success was so great that the bladder of age became once more the bladder of youth. The high opening was very soon supplemented by a perineal drainage. The current of surgical thought and action was diverted for a time by the general record of success which followed the introduction of castration by White and the revival of Bottini's operation by Freudenberg. The mutilating instinct of the surgeon was not, however, fully aroused until Belfield and McGill showed the feasibility of removing part or the whole of the prostate by the suprapubic route. The main line of attack was, however, soon transferred to the perineum, and the various methods suggested have finally culminated in the carefully studied and well-planned operation of Murphy, which seems to accomplish the complete removal of the obstruction with less dangerous disturbance to the parts involved than any of the other procedures yet suggested. Thus from very partial removal or mere incision we have come to advocate the complete removal of the entire organ. We have thus just reversed the course pursued by our friends in abdominal work. Whether we will have to recede from the position now reached, time alone will tell.

The case I have recorded would certainly seem to show

that complete perineal prostatectomy will enable us to deal with a class of most distressing cases in a more satisfactory way than ever before—cases which have remained rebellious to other methods.

It is not, however, to urge the advantage of this operation that I have chosen the subject of my paper, but rather to utter a warning—protest probably is the better word—against the marked tendency of the present time to subject the victims of prostatic obstruction to mutilating operations. In nearly every discussion which takes place on this subject the necessity for early operation is pointed out, so as to avoid the danger of operating in the presence of damaged, dilated kidneys, for here, as in all operations upon the urinary organs in man, the kidneys dominate the situation. Herein lies the danger, and the very success of the method is likely to sweep us onward with the current into useless and perhaps harmful operations, and lead us to forget the real merits of older and more conservative methods, for I am strongly convinced that the method of choice in the largest proportion of cases of hypertrophy is still the proper and judicious use of the catheter. I recognize its danger, and I always feel the responsibility of urging a patient to commence a catheter life. On the other hand, I have too often seen men continue for many years in active, useful life to doubt the efficacy of the properly used catheter in staying the secondary changes of bladder and kidney. I may mention as a fair type of such cases one now under my care. A college professor, aged sixty-eight years, capable of discharging all of his duties as teacher, and fully capable of active exercise, has recently been under my care for a cystitis with hypertrophy of the prostate. The urine was ammoniacal and contained some pus. This condition had come on within a few weeks, and had gradually been growing worse. More than six years ago this man came to me with symptoms that pointed to hypertrophy of some years' standing. There were constantly some ounces of residual urine,

with the usual nocturnal frequency of micturition. He had been strongly urged to have castration performed. I advised against mutilation and ordered the catheter used just before going to bed. This for a time sufficed, but within a year he was obliged to rely upon the instrument entirely. For fully five years he has used the instrument four times a day. Two weeks' careful treatment has fully relieved his recent cystitis, and he is now apparently where he was before. I present this case as a fair sample of a large, perhaps the largest, proportion of cases of hypertrophy of the prostate, and I contend that most of them will do well with careful attention to proper hygiene and the proper use of the catheter, with or without local treatment for the bladder.

I confess the case I have cited possesses the moral and physical conditions favorable for success. The patient is a self-contained man, capable of understanding and accepting the limitation which his condition places upon him. His sedentary life is likewise in his favor. Certainly now, for over six years, he appears little, if any, older, and continues fully capable of performing all his routine duties.

A second case exemplifies the same phase of the subject. A man, eighty years old, the father of a physician, is now in active life, entirely dependent upon his catheter after symptoms of hypertrophy lasting for more than fifteen years.

Another aspect of this subject may be presented in the history of the case, the specimens of bladder and kidney from which are now before you.

H. R., aged eighty years, entered my service in the Cincinnati Hospital on September 26th. He was then suffering from dribbling of urine, which he could not control, and for some years he had had trouble with his bladder, a condition of incontinence, with attacks of retention from time to time. He was emaciated and weak in both mind and body, so it was impossible to obtain any connected history from him. His urine dribbled continually. It

was purulent, alkaline, of rather low specific gravity, contained some albumin, but no sugar. The ordinary soft catheter failed to pass, but the bladder was readily entered by an elbow catheter and some ten ounces of residual urine found. Rectal examination determined the presence of some slight hypertrophy. The bladder was washed out daily with boric acid, and nitrate of silver was then injected. The general decline was gradual, but marked, and he died on October 12th. The specimen obtained at the autopsy, now before you, presents the typical condition of those found in long-standing obstructions, a thickened and sacculated bladder and dilatation of the ureter and kidneys. Bladder and kidneys both contained a quantity of pus. The body of the prostate was hardly if at all enlarged, and the middle lobe, which presented a slight teat-like prominence, seemed too small to really offer a serious obstruction.

It is a matter of interest to speculate how the sequence of events took place in this case. Had it commenced as a case of simple obstruction from the hardly enlarged prostate, or had infection of the bladder first, and later the kidneys, played the more important rôle, and would active surgical interference some years back have accomplished any better result and prolonged life beyond eighty years? In such a case would not simple perineal drainage or Bottini's operation have been equally efficient with a prostatectomy, an operation which would have been difficult of performance from the small size and indurated condition of the gland? At no time while he was in the hospital did his condition justify operation of any sort.

But no matter how large the number of cases may be in which early and judicious treatment will indefinitely postpone the evil consequence of hypertrophy of the prostate, there still remains a great and distressing class of cases in which surgery must find relief for the obstructed flow of urine and cure of the cystitis. A certain proportion of these will yield favorable results, oftentimes, indeed, complete

relief, by simple perineal incision, with drainage for some weeks, as was well shown by Harrison. It is in the large remainder that perineal prostatectomy promises a field of usefulness. It must not be postponed too late, or a large percentge of mortality will surely ensue. It must be looked upon as a grave surgical procedure involving a considerable loss of blood, a notable laceration of tissue, and requiring a somewhat prolonged anæsthesia, all conditions badly borne by this class of persons. That it is possible and effective experience already shows; whether, however, permanent immunity will be secured from a progressive cystitis and further involvement of the kidneys remains to be seen, and whether many of those operated on between sixty and seventy years will reach the age of eighty years is something yet to be determined. The operation of complete perineal prostatectomy is still too young for us to judge of the future of these patients.

Success, indeed marked success, has followed all forms of drainage, only to be followed by an intractable distressing cystitis when the natural channel was resumed. It may prove to be so in cases of prostatectomy, and we may return, as is said to be the case in the Guyon School, in France, to the catheter and asepsis.

It has not been my purpose in this brief paper to decry the merits of any of the newer operations upon the prostate, whether they be Bottini's operation or prostatectomy—the latter especially, I am convinced, has a field of usefulness when used with discrimination—but simply to urge most strongly the necessity of our not being carried away by an operative furor which may lead us to the same excess which a few years ago characterized the surgery of the ovary, an excess which is now followed by a marked recoil; and to further urge the fact that the older methods still possess a large field of usefulness, so large, indeed, as possibly to include the majority of all cases of hypertrophy that are seeking relief.

One part of Murphy's experience is, I think, worthy of

special notice, and that is the ready manner in which stone in the bladder can be dealt with after a perineal prostatectomy. The necessary opening of the urethra affords a happy opportunity for the extraction of stone.

Hypertrophy does not contraindicate lithotrity, but certainly renders it less satisfactory and more liable to recurrence of the stone and persistence of the cystitis. I can see a large field of usefulness for prostatectomy in these cases, affording as it does an opportunity to remove the obstruction and stone at the same time. Its selection, however, will have to be determined by the vitality of the patient. I have put up a petition that we may be kept from wandering too far from the older faith. From the errors and dangers of successful surgery, good Lord deliver us.

DISCUSSION.

Dr. A. H. Ferguson, of Chicago.—I have been greatly interested in this paper. The present status of the priority of perineal section dates somewhat as follows: First, Goodspeed, of California, 1891–1892; Frey, of Toledo, Ohio, 1896; Nichol, of Glasgow, Scotland, 1898; and then come Syms, Cabot, Alexander, Ferguson, Murphy, and my friend Young.

The present status of the indication for an operation is that as soon as the urinary flow is interfered with and is not overcome by massage of the prostate and treatment of the deep urethra, then some one of the radical operations ought to be done.

The present status of the incision, I think, resolves itself into the median incision as the proper one. The Y-shaped incision is being discarded. The median incision does not tear the floor of the perineum or injure the pudic artery, and there is not as much hemorrhage. It is the incision of the expert.

We can attack it in one of three ways: suprapubic, through the perineum, or by the Bottini operation. I think the vast majority should be done by the median incision. The Bottini I am inclined to limit to two conditions: when there is a bar running between the lateral lobes, and when

there is a small median lobe. The suprapubic operation does not have as much place in treatment as it did a few years ago.

The present status of the removal of the whole prostate is that we can remove the whole prostate through the perineum with less risk than we can suprapubically. In the vast majority of cases you can enucleate the prostate with the finger. When the bladder has been attacked by repeated inflammations it must be removed piecemeal.

The present status of dealing with the prostatic urethra is that we can remove the posterior prostatic urethra, and some have reported removing the entire prostatic urethra without stricture. We used to be afraid of opening the membranous urethra, but after meeting with a number of cases of enlarged prostate and stricture, we have found that we can with impunity open the membranous urethra.

Of course, we all know the gross pathology, about the extension of inflammation upward to the kidneys, and so on; but the minute pathology is somewhat in dispute. Dr. Greene, of New York, claims in a study of a large number of cases, that all the microscopic changes have been of an inflammatory character. I have gone over most of my cases and find that was true.

The present status of the perineal operation is that there are to-day about two hundred cases reported with less than 5 per cent. mortality.

Dr. Hugh H. Young, of Baltimore.—Dr. Dandridge's paper has interested me very much, and his specimens are very instructive. The one showing an interior lobe is quite a rare finding. In about 150 cystoscopic examinations of hypertrophied prostate I have only seen two cases, and in the large collection in the museum of the Royal College of Surgeons I found only two such specimens. The obstruction is most frequently produced by the lateral lobes, the urethra being flattened into a mere slit in many cases. The median lobe, in my opinion, does not play the important rôle that it is generally credited with, for although it frequently causes much obstruction it is more often secondary in importance to the lateral lobes.

I fully agree with both speakers as to perineal prostatectomy. It is unquestionably the best method of removing the enlarged prostate in most cases. When we had only the Alexander operation, requiring both perineal and suprapubic

wounds, perineal prostatectomy had very little to commend it over the suprapubic method; but now things have changed, and we have learned how to enucleate the prostate through the perineum without the aid of the suprapubic incision. Syms' intravesical traction balloon was the first great step in advance. Other devices have been used, such as Murphy's sharp hooks, and Ferguson's capsular retractors. But neither of these in my opinion are as efficient as the instrument of Syms. The main object is to pull the prostate well down into the perineal wound so that it can be enucleated with ease, and under visual direction For this purpose I have devised a double prostatic tractor, which when closed may be passed into the bladder through the prostatic urethra, and then its two fenestrated blades may be rotated in opposite directions, in which position it is impossible with the strongest traction to pull the instrument out of the bladder. By strong traction upon this instrument I am able to draw the prostate almost into the skin wound, where the enucleation may be easily done with delicate dissectors, which I have found to be much better than the finger. Another advantage is that you can see every step in the procedure and can operate so as to avoid the ejaculatory ducts and the urethra. After the operation is over the blades can be brought together and the instrument easily withrawn. I have now used this method in seven perineal prostatectomies, with first-rate success in each case.

I was glad to hear Dr. Dandridge's words of caution against very radical operations on weak and aged patients. Many of these unquestionably cannot stand even the ether which is necessary for perineal prostatectomy, and much less an operation of such magnitude.

I think Dr. Dandridge too conservative, however, in suggesting the catheter for these cases, for I have found that they can be handled with perfect success by the Bottini operation, which can be done under local cocaine anæsthesia.

It is useless to belittle this procedure, for it has proved its wonderful efficacy in these very desperate cases, and has come to stay. It is not to be preferred to a prostatectomy in those who can safely stand the latter, and I have always held that prostatectomy is the ideal procedure when it can be safely performed. Out of nearly one hundred cases in which I have operated I have thought it safer in over half of these to do the

Bottini operation, and I feel certain that many who are now alive and well would not have stood a radical operation under general anæsthesia, for many were very old men, five over eighty years of age, and many others within a few years of eighty.

Dr. Dandridge (closing).—I wish, Mr. President, to say that I appreciate the discussion which has taken place, and I hope it has been as valuable to everybody as it has been to myself. The special purpose of my paper was to enter a warning against what seemed to me to be a too great tendency to operation on the prostate. We do have in the older methods a method which has certainly served us in a great many cases. It may lead on to more serious consequences. I feel it is a matter that is still *sub judice* as to whether we should submit these cases to such a serious operation as prostatectomy. I have had no experience with the Bottini operation. I was very glad, indeed, to hear Dr. Young emphasize the danger of suppression of urine after suprapubic operation. I think that is the great danger. I thank both the gentlemen for the discussion.

CONSERVATIVE OPERATIONS UPON THE OVARY.

By L. H. Dunning, M.D.,
Indianapolis, Ind.

The importance of conservative operations upon the ovary lies in the possibility of such procedures resulting in the removal or cure of diseased portions of this organ without detriment to the healthy structure. By this means, if successful, the menstrual function may be retained as well as the power to bear children.

The present status of the work has come as a result of evolution of ideas and methods. It is interesting to note the development of ideas and methods that has led up to the present stage of desire and procedure.

As the writer sees it, the process of evolution has been somewhat after this plan: Battey removed normal and abnormal ovaries to bring about the establishment of the menopause, in order to rid the patient of certain nervous phenomena, hemorrhage, or other disorders dependent upon menstrual derangements.

About the same time Hegar began removing the tubes and ovaries for inflammatory disorders that resisted other plans of treatment, and a little later Tait made popular salpingo-oöphorectomy for the cure of suppurative disease of these organs and for certain gross and otherwise incurable menstrual disorders. Tait's phenomenal successes, and the brilliant manner of presenting them, soon rendered such operations popular. It is astonishing how rapidly the ideas of these three men spread over the world and how common it became for surgeons to extirpate the uterine

appendages. Indeed, such operations became common in all parts of the civilized world, and the indications for them extended until they were done also for epilepsy, insanity, reflex pains, and general ill health.

When sufficient time had elapsed it was found that extirpation of the ovaries was not a panacea; in fact, that it was comparatively valueless for the relief of pain, epilepsy, and insanity, and furthermore, that the sudden arrest of menstruation, especially in young women, oftentimes brought a distressing train of symptoms, which was harder to bear than that produced by the first morbid condition, and led to greater ill health than did the original lesion.

Now came the struggle between those who condemned oöphorectomy *in toto* and those who claimed for these operation in selected cases highly beneficial effects. Just at this point, Martin brought forward resection of the ovary as a partial solution of the difficult question. His teaching was accepted by many, and the idea was extended by a few earnest observers.

The whole subject has been a fascinating one, and has engaged the attention of many of our most eminent surgeons. It has now been on trial in this country some ten years, and it seems to me the time is ripe to reach some definite conclusions as to the scope and influence of such operations.

Like all kindred subjects, the benefits of conservative operations upon the ovary must be settled by the test of the experience of many reliable observers, and not by the statistical study of the brilliant results of a few operators. The error of accepting as final the conclusions of a single man or of a school is well understood, and needs no argument for verification.

It is time to gather the experience of a great number of operators and let the teaching of this experience govern us. It is the writer's belief in the strength of the last statement that has emboldened him to bring forward his experience in this matter and lay it before you.

During the last seven or eight years the writer has occasionally, whenever the case seemed to require it, employed conservative methods in dealing with cystic ovaries and with small hæmatoma of the ovary. The cases he has found most amenable to treatment in this maner are those of small single retention cysts, especially when one ovary had been removed. These cysts were dissected out of the ovary, great care being exercised in removing every portion of the lining membrane of the cyst. The edges of the wound were then approximated by a running stitch of fine catgut, carried by a round-pointed needle. A like method was employed in dealing with a small hæmatoma.

When there were multiple cysts of the ovary as large as a pea, situated in various parts of the organ, and some of them deeply seated, or if there were two or three detached blood cysts, the writer has found it safer to remove the ovary, because he has, he believes, come to know that it is diseased to such an extent as to be incurable; indeed, his experience has led him to the belief that cystic degeneration of the ovary is a progressive disease, so that it will in many instances progress until the normal histological structure is completely changed.

In a considerable number of cases, when numerous cysts were present and the organ appeared in other respects healthy, he has simply punctured the cysts with a sharp-pointed knife, wiped the surface dry, and dropped the organ back into the pelvis.

The thermocautery has been used a few times to sear over bleeding surfaces or to destroy the lining of the cyst when it could not be readily removed. He has always been afraid of producing too great a destruction of the structure of the ovary by the hot iron, or the production of too large a scar, which is prone always in this organ to become painful. By these various methods he has operated upon considerably more than one hundred cases.

In the majority of instances the results have been gratifying, that is to say, a majority of the patients have been

comparatively free from pain after the operation, and a goodly number of them have borne children. He has not been entirely satisfied with the results, for the reason that a considerable number of the patients have experienced continued ill health, and at least 20 per cent. of them have returned to him complaining of pain in the remaining organ, and asking for another operation.

One fact has been impressed again and again upon the writer. It is that conservative operations upon sterile married women are unfavorable, and most unfavorable upon such barren women as are determined never to bear children. He has often seen such women unbenefited by correction of retrodisplacements of the uterus and resection of a part of the ovary, so that he has finally reached the position of declining to do any such surgical work upon them until he has given a detailed history to them of his unfavorable experience and exacted from them a promise to desist from any measures to prevent pregnancy.

A few failures at the beginning of his work convinced him that a part of an ovary could not be saved and the patient cured in a majority of cases in which there was multiple cystic degeneration, when cysts, even though small, were found near the hilum of the ovary, and in cases in which there were two or more separate and detached hæmatoma or of retention cysts of considerable size. In such cases the writer believes the ovaries are so far diseased as to be incurable, so that the interest of the patients demands extirpation of the ovary if anything is done with these organs. These observations naturally lead up to a subject of great importance, viz., Is it better always to remove an incurable diseased ovary?

For my part, my failures in one line and successes in another have generally led, and happily too for my patients and myself, to the point of exhausting every means of cure or palliation before operating upon the sterile patients above referred to, and in all cases of retroversion of the uterus and prolapsus of the ovaries, without adhesions,

in women who are not confirmed invalids, and who do not show on palpation gross lesions of the ovaries.

A brief reference to these methods may be proper. A somewhat considerable experience in treating cases of movable, retroverted uteri, with or without prolapsus of the ovaries, by tampons and posture, and later by properly fitted pessaries, leads the writer to believe in the frequent curative and palliative effects of these measures. Certainly to obtain the fullest benefits from such methods due attention must be given to every unfavorable condition of the body and every vicious habit of life, the correction of which will supplement the local efforts. Constipation must be overcome, tight lacing, with short corsets and the dragging of heavy skirts, must be avoided. So too, must be removed the baneful influence of sexual perversions. Bicycle riding and dancing are harmful to such patients, and should be avoided. Healthful exercises, especially those tending to give tone and development to the muscular system, should be introduced.

The writer has seen so much benefit accruing to patients by the use of these means that he would give them a fair trial before resorting to surgical means in the cases not marked by distinct inflammatory lesions, and most certainly would he employ some such means in general enteroptosis, in which displacements and chronic congestions of the uterine organs are but a small part of the existing lesions.

Now it will be seen by what has already been said that the writer holds very conservative views upon the subject of conservative operations upon the ovaries. He is aware that there are many able and conscientious gynecologists who hold widely different views. With them he seeks no controversy. Their knowledge and experience must guide them as yours and mine must guide us.

A few years ago the writer began examining the right ovary in all cases in women in which interval operations were performed for appendicitis. The incision was made

in the right semilunaris, so that there was no difficulty, as a rule, in bringing up the right uterine appendage. He was at first surprised to find so many cystic ovaries, and ovaries in which there was diffuse œdema. A few conservative operations were done upon such ovaries, but such procedures were not continued, because of the frequent subsequent persistence of the pain and disturbed menstruation. Of late, for a couple of years now, he has either removed the ovary entire or dropped it back unmolested.

So far our discussion has been limited to a consideration of cases in which cysts or hæmatoma were removed. Suspension of prolapsed and congested ovaries should be deemed conservative work. I have seen quite a few instances in which this procedure was done in conjunction with ventrofixation of the uterus, and have seen pregnancy and happy deliveries follow, and this, too, without resections of an ovary.

Dr. Goldspohn in his admirable paper of last year properly called attention to the necessity of great care in avoiding the introduction of septic material in conservative work. The ovary does not seem able to withstand the action of infective material when the external tunic is broken, and this is to my mind one of the most effective arguments against conservative work in suppurative cases. For my part, I am done with any attempt to resect an ovary in cases in which there is pus in a tube or any part of an ovary.

Within the last few months five cases have come under my professional care in which conservative work has been done upon the ovaries and a secondary operation has been necessary. A considerable number of other cases have applied for a secondary operation; but as no gross lesions of the ovary could be determined on palpation, they were advised to try other treatment and wait. Two of the cases operated upon were in patients upon upon whom I had operated previously, and three cases

were from the hands of other physicians. My own cases will be reported first.

Case I.—Mrs. A., aged twenty-nine years, was a prominent young society woman. She had suffered an accidental abortion six weeks previous to her first call upon me. At that time she was suffering from metritis, retroversion of the uterus, and prolapsus of the ovaries, and metrorrhagia.

She was up and about the room part of the day, but suffered pain and bearing down and vesical disturbances. She was sent to bed, hot water douches given, glycerin tampons applied twice a week, and internally was given a saline, as needed, to regulate the bowels. Bromide of potassium and infusion of cotton-root bark were also administered. Under this treatment there was considerable improvement, but the hemorrhage continued and the uterus became retroverted on removal of the tampons.

In a few weeks we though it safe to curette the uterus and restore a badly lacerated cervix uteri. This brought relief from hemorrhage and considerable improvement. Still the patient remained an invalid, and there were evidences of chronic inflammation of the right ovary.

January 25, 1900, a ventrofixation was done and the right ovary extirpated. The latter was much enlarged and soft. The left ovary, aside from containing a small retention cyst the size of a hazelnut, seemed healthy. The cyst was dissected out and the wound closed with a fine catgut continuous stitch.

The patient made a normal recovery from the operation, and seemed well for a few weeks, when she began having marked pain in the left ovarian region. After a time she began importuning me to remove it and the uterus also, as she declared she was an invalid and a continual sufferer. All means to bring relief were unavailing, so five weeks after the first operation the abdomen was again opened and the left ovary and uterus removed. The ovary had

greatly increased in size, bearing a few small cysts and otherwise in condition of diffuse œdematous inflammation. (Pozzi.)

The patient made an excellent recovery, gradually regaining her health, though for some months she suffered as do all young women who have endured the loss of the uterine appendages.

Case II.—A young married woman who had borne a child nine months previously. She had chronic subinvolution, retroversion of the uterus, and prolapsed right ovary. She had been under a course of five months' treatment without relief. January 5, 1901, a ventrosuspension and removal of right ovary were done, and from the left ovary a retention cyst the size of a hickory-nut was dissected out. Otherwise the ovary seemed healthy. The patient made a normal recovery from the operation, but at the end of four weeks began suffering pain in the left ovarian region. This pain persisted, and was accompanied by backache, almost constant headache, so that at the end of three months she was confined to the house a greater part of the time and to bed about one-half the time.

The left ovary was removed. It was large, containing a small hæmatoma, and in other parts œdematous. This was an interesting specimen on account of the location of the hæmatoma. It was at the outer extremity of the ovary, whereas the one dissected out at the first operation was located at the inner extremity of the ovary. Neither of the above cases showed pus in the pelvis, and at neither operation was there found any marked adhesions.

Case III.—Mrs. D., aged thirty-one years, consulted me December 15, 1900. She had been twice married and had never borne children. Was operated upon two years ago by an eminent surgeon of our city for the removal of a small cyst of the right ovary. This ovary was extirpated by the vaginal route, the incision being made posteriorly. A few cysts in the left ovary were punctured. After a normal recovery all went well for a few weeks,

when she began having pain in the left side, backache, headache, etc.

At this time on palpation the uterus was found to have limited motion, the left ovary was prolapsed and adherent and much enlarged and very sensitive to pressure. I proposed to try for a time gentle massage and tamponing. This was done without relief. Invalidism was developing. January 23, 1901, the ovary was extirpated. It was found embedded in adhesions, considerably increased in size, and contained a small encysted blood clot. The ultimate results of this operation were favorable, though she had not when last seen entirely regained her health. She is, however at work.

Case IV.—Miss Z., aged twenty-seven years. She has been in ill health several years, has been twice operated upon, once for hemorrhoids and for endometritis by curettement, and a second time by abdominal section, at which time the left ovary and both tubes were removed, also a small cyst of the right ovary punctured. This patient was told there was pus in both tubes. The patient had no difficulty in recovering from the operation, but did not do well afterward. I operated on her May 13, 1901, removing the right ovary and fundus of the uterus.

The ovary was prolapsed and adherent and contained a small superficial abscess. The abscess evidently began from the external surface from a point of contact with a silk ligature which had been used in tying the mesosalpinx at the former operation. Since this operation the patient has enjoyed better health than for some years, but is far from being well at present. Her continued ill health seems to be chiefly due to colitis.

Case V.—Mrs. Y., aged thirty-five years, a widow of two years, came to my service at the Bobbs Free Dispensary, complaining of pain in the right ovarian region, backache, headache, and dyspepsia. An examination showed a ventral hernia at the site of an abdominal scar. The uterus was fixed to the abdominal wall anteriorly, and there

was a mass the size of an orange in the right side of the pelvis. This I believed to be a follicular cyst of the ovary. This patient had been operated upon in a hospital in Chicago about one year previously. One ovary was removed and the other resected and a ventrofixation done. I sent her to the Deaconess' Hospital and operated upon her in March, 1902.

Upon opening the abdomen a retention cyst of the right ovary as large as an orange was found. It was located in the cul-de-sac and firmly adherent, so that its removal was difficult. The fundus of the uterus was fixed to the anterior abdominal wall at the lower end of the scar, and just above this attachment was a small ventral hernia. The scar showed evidences of suppuration at the time of the former operation. This patient made a normal recovery and gradually regained her health.

I have been candid in the report of failures, but do not wish to leave the impression that the failures have impressed me the most deeply. I know of six women upon whom I have done conservative operations upon the ovaries who have borne children and are happy in their motherhood. The vast majority operated upon by this means have been either cured or greatly improved in health.

The history of many cases might be given in detail, showing the great benefits of the procedure; for instance, there is a group of ten cases of girls and young women under twenty-five years of age who were operated upon for the removal of medium-sized ovarian tumors, of one ovary in which the opposite ovary contained a retention cyst which was extirpated, and the patents after a period of from one to five years have continued in good health and without the necessity of a second operation.

In these cases, even though a second operation should be required, they have already been compensated for the risk of such a procedure. There can be no doubt that cystic degeneration is in many instances a progressive

disease, and this is what makes the question of conservative work a difficult one of solution.

My conclusions are:

1. Operations upon the ovaries that preserve the menstrual and reproductive functions should be employed in lieu of complete extirpation, especially in cases of extirpation of one ovary and where the remaining ovary shows as pathological changes a single cyst of moderate size, or several small cysts, or a single small hæmatoma.

2. Healthy displaced ovaries may with advantage be anchored in as nearly a normal position as possible by stitching them with fine catgut to the posterior surface of the broad ligament or by shortening the infundibulo pelvic ligament.

3. Cases of sterile married women and married women who are using means to avoid pregnancy are unfavorable subjects upon whom to do conservative operations upon the ovaries.

4. The writer believes that in pus cases such conservative operations should as a rule be avoided.

DISCUSSION.

Dr. George H. Noble, of Atlanta.—I have been very much interested in this paper, because it is in the line with my own observations. I do not believe we will get good results if we attempt to save infected ovaries. In the removal of a simple cyst or hæmatoma of that organ, I find the use of the curette in turning out the cyst or clot gives the best results. If ligatures are used they should be buried, otherwise they are liable to excite adhesions even in aseptic cases. In my work I try to conserve all healthy tissue and remove only the diseased parts, and I am satisfied it is right.

Dr. Henry T. Byford, of Chicago.—In ancient times, as it were, we removed ovaries *ad libitum*, and have learned from that fact that patients get along as well without ovaries as with them, as far as good health and the vital functions are concerned. It is better for a woman to have no ovaries than to suffer from diseased ovaries.

There is one paramount reason, however, why we should never castrate a young woman without good cause. This reason is that society considers her a sexual animal and demands sexuality. If we castrate a young woman the time may come when she will regret it. She may later come to the conclusion that she wants to get married, and the fact that she will be childless and without ovaries is apt to render the husband dissatisfied, or may deprive her of an opportunity to marry.

When a woman is castrated in early life, premature atrophy of the sexual organs, including the vagina, while not harmful (it may even be beneficial to her system), may render the sexual act painful or even injurious, and thus lead to unhappiness.

Therefore, I think that we should very rarely castrate young women and resort to resection. The diseased parts of the ovary should be cut out and the cut surfaces approximated by fine catgut sutures. When trouble arises out of the operation it is usually because the operation was not aseptic, or too much of the diseased ovary was left.

In several cases in which the patient herself would under no consideration consent to the removal of both ovaries, I have removed a painful pyosalpinx from one side and left the other ovary and tube buried in dense adhesions, knowing that the least traumatism to the remaining appendages would be followed by bad results. Such women, who considered a bad ovary better than none, have usually enjoyed life and have led an active life, and have not returned to molest me.

Dr. Walter P. Manton, of Detroit.—I have enjoyed listening to Dr. Dunning's paper, but I must say that my own experience in this line of work differs from that of the essayist. Some eight years ago I began to do conservative work on the ovaries, and I found in the majority of instances the results were satisfactory in relieving symptoms, the patients having done well. I have often removed an ovary on one side, and resected the ovary of the other side, or have resected both ovaries, for cystic or diseased conditions, leaving a remnant of healthy organ in order that the woman's sexual life might be preserved. The results have usually been satisfactory, but I have had a few unsuccessful cases which have led me to be skeptical regarding the good work which I may have done. Failure is apt to make one question even one's successes.

I had a case a short time ago in which I removed the left appendages and resected the right ovary. The woman made an excellent recovery. I removed about two-thirds of the ovary. Three months later she returned to me with symptoms of backache, and wanted something done. I made a vaginal section, and found a tumor the size of a filbert embedded in the posterior vaginal wall at the junction of the cervix. In examining the condition of the right (resected) ovary I found that it had undergone cystic degeneration, and was the size of a hen's egg; there was little ovarian structure left. The cyst was so covered over with soft adhesions that I could not tell whether it was of the ovary or in the broad ligaments. The report of the microscopist stated that the cyst contained ovarian structure, and was unquestionably the remnants of the right ovary. The tumor, which was embedded in the vaginal tissue, also contained ovarian structure, so that the woman had a third ovary. In the majority of cases, in my experience, the resection of a cystic ovary or the puncture of cysts of the ovary, cleaning out of the cavity and swabbing with carbolic acid followed by alcohol is followed by satisfactory results, and the majority of patients have not had a return of the pain from which they previously suffered.

Dr. George J. Engelmann, of Boston.—I think we all now agree that it is desirable to leave *in situ* as much healthy ovarian tissue as will preserve the sexual activity of the individual, and the question is no longer "How to remove the ovary," but "*What part* of the tissue and *how much* can be removed and the menstrual function still be preserved?" In other words, how much can be removed in order to relieve the condition of the patient, how much must be left to preserve the function? It would appear to me that we are all in accord in our adhesion to the general principle of conservative surgery; we all believe that it is desirable to preserve the menstrual function if this can be done compatible with the relief of suffering. If the diseased area can be removed, and the menstrual function yet preserved, it is well to do so. The question before us is, *What must be removed and how much must be left?* There appears to be a wide margin and no definite rules can be laid down; in some cases menstruation will cease although fully one-third of the ovary be left; in others the function continues when particles only of the organ remain—bits of ovarian tissue caught in the pedicle. In the early days of what we

now call conservative surgery, Schroeder reported some six or eight cases, of which it was my good fortune to see three, in which he had left the healthy portions of the ovary in hopes of preventing a premature menopause, and only in some of these was the menstrual function preserved even though large portions of tissue had been left. On the other hand, it has been shown that we can remove a great deal, almost all the ovarian tissue, and still preserve the menstrual function. It is a question how much must be left. I have in mind one striking example of such, though unintentional, conservative surgery; the case occurred in my practice nearly twenty years ago. In this instance a very large ovarian tumor existed on the left side, with the tube adherent and materially expanded. On the right was a cyst the size of an orange, with a long, slender pedicle and the tube partially adherent. This tube was removed in part and the thin pedicle of the tumor ligated, leaving perhaps one inch and a half; the entire left tube and the large ovarian tumor on that side were completely removed. The patient menstruated regularly from the day of the operation, bore a healthy child fourteen months later, and has menstruated regularly ever since, but has not conceived again. The larger part of the right tube was left, and part of the long, thin, ovarian pedicle, perhaps one-third the thickness of a lead-pencil, but apparently membranous. With the small amount of ovarian tissue possibly remaining in this pedicle and a part of the tube, which was not patent at the time of the operation, as it had been ligated, it was possible to preserve the menstrual function. The patient had suffered in various ways. She was cured of all reflex symptoms, and also those caused by pressure of the tumor, she was restored to perfect health. A little ovarian tissue, as was shown two years afterward by microscopic examination, persisted in that pedicle and the tube, which astonished me at that time, evidently again opened. We know that this is possible. We know in fact that it frequently occurs; how it becomes patulous, I do not know, but we have cases on record in which the tube has been tied and cut, yet a later operation showed it to be patulous, and in fact, it would seem that it is almost as difficult to keep it closed. In some of the cases of Schroeder, as much as one-third of one ovary was left, yet functional activity was completely destroyed, apparently showing that we cannot positively rely on the continuance of

the function from portions of one ovary. Possibly this may be due to local disturbance caused by imperfect asepsis. I would ask those who have given attention to this subject to consider more especially the question, *How much ovarian tissue it is necessary to leave to preserve the function?* If we can approximate that, we will be able to know better how far we may venture in "conservative surgery."

Dr. J. G. Earnest, of Atlanta.—I wish to say that the experience detailed by the essayist, and which has been repeated by the gentlemen who have preceded me in this discussion, has probably been the experience of every gentleman in this room who does much work in this direction. So far as I am personally concerned, I have reached that stage where I throw very largely the responsibility of the election of the operation on the patient and her friends. In other words, I think she has a right to know from me what she may expect from a conservative operation, and what she may expect from a radical operation. I make a plain statement to her and her friends, and then let her say what shall be done.

Dr. A. M. Cartledge, of Louisville.—I do not believe the Association should go on record as advocating the removal of both ovaries in young women simply because they have pus tubes. I agree with Dr. Byford in this respect, that frequently we see a number of unfortunate young women who have acute suppurative salpingitis whose ovaries are normal, and it seems outrageous to unsex such women. The most unfortunate thing in connection with our surgical work is that occasionally through desperate circumstances and conditions we have to rob a woman of both ovaries. In every case, if I can do so, I leave a piece of an ovary, if it is not larger than a grain of corn. These women, whose ovaries we remove, come to us years afterward complaining of domestic trouble as the result of the removal of the ovaries. They have gained materially in flesh; they complain of being too fat, and of distortion of form, and these cases are nightmares to me, and so I am saving every bit of ovary I can. I remove pus tubes frequently, leaving a third or one-half of the ovary, in order to preserve the menstrual function of the patient, and I see no ill results whatever; at any rate, nothing as compared with the fearful experience of seeing them afterward, when they begin to brood over the loss of their ovaries and have mental impressions as a result.

In regard to cystis ovaries, unquestionably in some cases it is necessary to remove the ovary or ovaries, if they are operated upon.

Dr. Engelmann.—Will you please tell us how much of the tube you would remove?

Dr. Cartledge.—I have removed one-half, one-quarter, or one-third in some cases, along with a portion of the ovary.

Dr. Richard Douglas, of Nashville.—The very important point emphasized by the essayist is that there is a conservative treatment of the ovaries, and it is surprising for a surgeon of Dr. Dunning's reputation to dwell upon the medical treatment of gynecological cases, yet his conservatism is most timely. The recently published records of one of our hospitals show that of nine thousand gynecological cases admitted, about seven thousand were subjected to operation. This shows the surgical tendency of gynecologists.

But speaking directly to the paper, I must admit that it is my observation that many women who have been subjected to so-called conservative operations upon the appendages are often unrelieved and not infrequently great sufferers; and it is not unusual that secondary operations are required to release adhesions or to employ more radical measures.

I rather think that Dr. Cartledge misunderstood the essayist. He did not advocate the removal of healthy ovaries when the tubes alone were affected, but he discountenanced the resection of infected ovaries, and with him I agree. When the tubes alone are affected we should not molest the ovaries.

Dr. Edwin Walker, of Evansville, Indiana.—We should not overlook the point that many of these patients who come to us have other affections than disease of the ovaries. Many of them are suffering from other diseases, so that an accurate diagnosis is absolutely essential before undertaking treatment. These patients may be suffering from some neurosis or disease independent of the genital organs.

Dr. Dunning (closing).—I have very little to say in closing the discussion. I am very glad that my paper has elicited such general expressions, both of sanction and disapproval. There are two or three points I wish to note, one in particular having been referred to by Dr. Douglas.

In reference to suppurative cases, I have had a considerable experience in this line, as all operative gynecologists have, and I never resected an ovary in a suppurative case that I did not

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regret it. Sometimes these ovaries are cystic, and in such cases the cystic ovaries can be treated by simple puncture of the cysts and the patients be restored to health. It is a fact, I think, that a large retention cyst may rupture and do no harm, and while the diseased part may not be restored to its integrity, it will give no symptoms after the cyst has disappeared. I think we may feel reasonably safe sometimes in pus cases in leaving behind ovaries that are cystic.

The purpose of presenting this paper is, if possible, to see if we can get a group of cases of this sort and lay down specific indications to guide us in conservative work. A large number of papers have been presented on this subject, some of them very enthusiastic, in favor of conservative surgery in all cases. If we study the cases that have been reported in the last three or four years, we will find either sweeping statements in favor of conservative operations, or sweeping statements opposed to operative intervention. There is a middle ground, without doubt, and if we can apply it to these cases we will have accomplished something. I mentioned the indications which have developed in my mind after a somewhat considerable work, and they are, as I have stated, my positive convictions, and I hope they will help us in our future work.

I cannot agree with Dr. Byford in the belief that a woman is as well off with the menopause established at thirty years as she is at forty or forty-five years. That has not been my experience at all. Some of the women who have had their menopause artificially established early have been nightmares to me; they haunt me. I never touch an ovary for the purpose of removing it in a young woman unless I feel compelled to do so.

There are two or three reasons why we are disappointed with conservative surgery. One of them is that we are not able to determine, with the ovary in our hands, the exact pathological condition there is present. In two of the cases I have reported, to all appearances the ovaries were absolutely healthy at the time of the operation; the operation was done aseptically, and yet in from six weeks to three months I found that the ovary went on developing cysts and œdema, and giving rise to symptoms demanding their removal.

Another difficulty that arises to trouble us in giving our judgment as to the benefits of operation is, that frequently our patients return home and are subjected to untoward circumstances that give rise to disease. For instance, a woman will

not bear any children; she will indulge in sexual perversion, which gives rise to pelvic congestion, chronic inflammation, and the development of disease of the ovary, which is incurable. Again, she goes home; her husband has become infected with gonorrhœa, perhaps, and he infects her. These are some of the unfavorable conditions that may arise after conservative surgery done upon these organs.

I want to thank Dr. Walker for calling attention to the importance of making an accurate diagnosis in these cases, because that is absolutely essential. We do not need to operate in all cases. I have had to learn this lesson by degrees. I have seen so many cases of retroversion and of chronic inflammation of the ovaries that have been symptomatically cured without surgical interference, that unless I find some palpaple disease of the ovaries I prefer not to do surgical work upon these organs.

THE SURGICAL TREATMENT OF PANCREATIC CYSTS, WITH REPORT OF TWO CASES.

By A. Morgan Cartledge, M.D.,
Louisville, Ky.

Cysts of the pancreas, while rarely encountered, are still the most common pathological condition of this deep-seated organ that we are called upon to treat surgically. There is little doubt but that the field of surgery as applied to the pancreas should be extended, and some of the more recent contributors to the subject (notably the contribution of Park) will attract the attention of surgeons to this almost unexplored region of the abdomen. Since Gussenbauer, in 1882, first operated successfully by incision and drainage for pancreatic cysts, there have been collected by Körte and others about 121 cases. Most operators have followed the practice of Gussenbauer, that is, incised the cyst, stitched it to the parietal peritoneum, and drained. According to Böckel, the cases so treated number 115. "In 99 of these the cyst was opened at the first sitting, with the result that 92 recovered and 7 died. In 16 cases the cyst was opened subsequently, after the formation of adhesions, with 16 recoveries and no deaths." (Tilton.) Certainly this table speaks well for the treatment by incision and drainage. Böckel has also collected 25 cases where extirpation, either complete or partial, of the sac was practised, with 4 deaths.

A comparison of the results shown by these statistics would seem to indicate that incision and drainage should be practised as a routine procedure in pancreatic cysts. And yet a closer study of the clinical forms which the cyst

may present, together with a closer study into the convalescence of the drained subjects, may cause us to attempt extirpation of the sac more frequently and with better results. It is a well-known fact that these accumulations in and about the pancreas do not all pursue the same anatomical route in presenting toward the surface. This fact I think should have great weight in deciding for or against complete extirpation. Undoubtedly evolution most often takes place below the stomach and above the transverse colon, the cyst carrying before it the gastro-colic omentum. Cysts so presenting are best suited to extirpation or, as I prefer to say, enucleation. Probably the next most frequent evolution of the cyst is above the stomach, or between the stomach and the liver. Such a cyst, if adherent at all, would present the gravest dangers in its enucleation.

Can the manner or direction of the growth be ascertained with sufficient accuracy as to enable us to select a method of procedure? I think so, in the vast majority of cases. Oftentimes the physical signs presented by the tumor will suggest this. The cyst which has evolved above the stomach is on a higher plane and much more fixed than that below. Cysts presenting below the stomach tend to displace the pancreas downward by traction, and so induce a condition of ptosis of this and surrounding organs. So great was this tendency in one of my cases as to permit me, acting in conjunction with a deep inspiration upon the part of the patient, to carry the cyst almost to the pelvic brim. Finally, the question may be definitely settled by a sufficiently long incision of the abdominal wall to permit of inspection. That extirpation is the ideal operation, did safety permit, few would dispute who have had experience with incision and drainage. The latter is slow and disagreeable to a tantalizing extent, both for patient and surgeon.

My experience with the treatment of pancreatic cyst is limited to two cases, one treated by incision and drainage, and the other by enucleation of the cyst. Both recovered.

Of the first I shall speak very briefly. The patient was a maiden woman, aged thirty-one years. Had enjoyed usual health until some two years before I saw her. Presented symptoms of indigestion, discomfort about left side—"around her heart," as she expressed it—loss of flesh and some anæmia. There was a tumor in the upper left quadrant of the abdomen, extending as far as the median line, most prominent at or just below the left costal arch. It was very tense and immovable. Exploration of left semilunaris, beginning at costal border, four inches in length. Dark, shining cyst came at once into view. The incision was enlarged, the hand introduced and passed deeply above and back of the cyst. The cyst was partially emptied of its contents by the trocar, drawn out, and incision made sufficiently long to pass my hand in and to the bottom of the cyst. I could plainly feel the pancreas through the thin cyst wall, the attached portion having the feeling as if there were interposed a granular deposit in its walls. It was now sutured to the parietal peritoneum and drained by two long rubber tubes reaching quite to the bottom. This patient displayed no operative symptoms of an unfavorable kind, but I thought the fistula would never heal; this finally occurred after several months of irritating discharge, and she remains well after ten years.

The second case is, I think, of great interest in view of the few complete extirpations that have been done, and I must say it leads me to believe we could practice this procedure oftener with advantage. I would lay particular emphasis upon the point that, in attempting complete removal, our idea should be enucleation with all that term conveys, viz., get to the cyst wall certainly, and stick to it surely, with the only instrument capable of a perfect cyst enucleation—the finger. When traversing omentum we must ligate carefully all bleeding vessels; after this is done, though many adhesions are encountered, if we keep our bearing to the cyst wall, few or no ligatures will be required until the pedicle (if there be one) or the special attachment

to the pancreas is reached. The cyst here presented would be called a very adherent one, and yet no difficulty was encountered in its enucleation by the method I have indicated. It was of downward evolution, the stomach being above and the transverse colon immediately across below, thus presenting through the gastrocolic omentum. Its attachment to the pancreas scarcely deserved the name of a pedicle. The report from my records is as follows:

Woman, aged forty-five years. Previous general health good; married; six children (two dead), oldest seventeen, youngest six years. About ten years ago felt enlargement in left side, below lower border of rib. Patient thought at time she was pregnant. About two or three months following she became pregnant. After birth of child she said she felt "as large as ever." The size of the tumor has not increased during its course—*i. e.*, size of a small water-melon. Had one child after this, presence of tumor not interfering with pregnancy. About two months ago noticed enlargement of thyroid gland, more marked on right side; is now about size of a hen's egg. Marked nervous symptoms, accompanied with tachycardia, are present with the enlargement. Urinary examinations normal. Pulse rate before going to operating room, 150.

With patient in horizontal position, a tumor as large as the head of a year-old child is seen, located in the left side of the abdomen and immediately beneath the ribs, approximately immediately in front of the left kidney. This tumor is perfectly smooth to touch, is elastic and freely movable, so that when lifted out of the left loin and pushed downward it simulates exactly in location and feel a cyst of the left uterine appendage. By vaginal examination no connection can be made between the tumor and the pelvic organs.

The abdomen was opened by median incision extending from a point half-way between the pubes and the umbilicus, upward to a point half-way between the umbilicus and the ensiform cartilage. The tumor was found to lie behind

the lesser omentum, the transverse colon coursing over its lower pole and being adherent to it. On dividing the gastrocolic omentum the sac of the tumor is encountered and is found to be adherent on all sides to neighboring structures. By dissection with the finger it is finally lifted out from its bed in the lesser cavity of the omentum, and finally remains attached only to the tail of the pancreas. The pancreas and the posterior wall of the stomach are in plain view in the field, and are immediately above the tumor and in contact with it. The attachment to the pancreas was now tied off and the tumor freed and removed. Bleeding during the process of enucleation was not severe, was chiefly venous, and was easily controlled by ligature. The incision through the lesser omentum was closed by catgut suture; except at its upper part, where it gave access to a drainage tube of gauze covered with rubber tissue. This drain was brought out through the abdominal wall about two inches to the left of the median line, opposite the upper portion of the incision. The first incision was closed with silkworm-gut suture. The wall of the tumor is of fibrous tissue, fairly strong and thick. The content of the tumor is a heavy liquid, dark brown in color, looking for all the world like a rich chocolate. The tumor weighs six pounds. Uneventful convalescence. Discharged July 23, 1902.

DISCUSSION.

Dr. C. H. Mayo, of Rochester, Minn.—I have been very much interested in the paper on this subject presented by Dr. Cartledge. We have had three cases of cysts of the pancreas, one of the patients having just left our hospital. There was that peculiar appearance of fat necrosis which, when seen for the first time, is almost unexplainable. It would seem as if the peculiar deposit could be picked out with forceps, and yet, when taken hold of, breaks apart into pieces of necrosed fat. The cysts were filled with this chocolate-like material described by the essayist. In that case also there were gallstones. Of the two other cases, one died. In one the cyst

was very large, and there was hemorrhagic pancreatitis. The chocolate-like fluid flowed out and was followed by a profuse hemorrhage, so that the patient began to sink, and died the next day. There is a great deal of literature on this subject of late, and I will not undertake to go into it, as the essayist has so thoroughly covered the ground.

Dr. L. H. Dunning, of Indianapolis.—With reference to the remarks of Dr. Mayo concerning gallstones being associated with cysts of the pancreas, I have encountered but one case, and that was associated with a stone in the ampulla of Vater. In this case the cyst was enormous, and there was also a large accumulation of bile within the gall-bladder, with dilatation of the gall-bladder. We had also in that case calcareous deposits in the cyst walls. The patient did well for a few days; we were compelled to drain on account of the profuse hemorrhage when we attempted enucleation, but the patient died at the end of two weeks of hemorrhage. I think in such a case as this, associated with gallstones, it would be folly to attempt to enucleate the cyst, because of the great danger of hemorrhage, and of the difficulty in enucleating it.

Dr. Richard Douglas, of Nashville.—Mr. Jordan Lloyd has emphasized the fact that there are true cysts and pseudocysts of the pancreas. Pseudocysts, which collect fluids in the lesser peritoneal cavity, generally owe their origin to some traumatism, and are preceded by a hemorrhagic effusion into the lesser peritoneal cavity.

The etiology of these cysts is somewhat incomprehensible. They are different from retention cysts. You will remember the experiments of Senn, who showed us that ligation of the pancreatic duct led to atrophy and not to cystic degeneration. Recently the work of Robson, Mayo, and others has shown the relation between gallstones and pancreatic disease, and it is possible in that connection we may have a true solution of the pathology. Cystadenoma, which is exactly like the proliferating adenomatous cyst, is found in the pancreas, and, of course, it is possibly of congenital origin.

The interesting point in connection with cysts of this organ is the direction of their growth. I have had experience with two cases of cysts of the pancreas. In these cases the relation of the stomach may be quite surprising. In some instances it may be pushed far to the right or directly over it, and not only the stomach may occupy this unnatural position, but other

organs, as the aorta and vena cava, have been found in front of cysts of the pancreas. I mention these facts simply to emphasize or rather to discourage the common mode of making a diagnosis, namely, by paracentesis. This is frequently resorted to, and it certainly cannot be done without danger, because the collapsed or flattened-out stomach or intestine or a large vessel may be punctured by the needle. Mr. Doran, who has given the subject a good deal of attention, has had one fatality from simple aspiration of a pancreatic cyst. A valuable point in the diagnosis of these cysts is that you have a dull area in the back which you can elicit by percussion. This was noticeable in my two cases. I did not attempt enucleation of the cyst, but treated both of them by drainage. One recovered. The other case was worth relating. The patient, a robust man, aged forty-four years, was operated on, the operation consisting of incision and drainage, and packing lightly with gauze. The edges of the wound became gangrenous, spreading slowly, and finally involved an area of the parietes as large as a dinner plate. The patient died from sepsis on the nineteenth day.

Dr. Alexander Hugh Ferguson, of Chicago.—I wish to mention briefly three cases that have come under my observation, and to refer to a class of cases not mentioned, namely, hydatid cysts of the pancreas. I have met with one such case, which I treated by drainage, suturing the pseudocyst to the skin, packing with gauze, and the patient (a girl) recovered. The second case was one of adenomatous cyst of the pancreas, which I enucleated completely. The patient recovered.

The next case was one of retention cyst due to carcinoma at the ampulla of Vater, which had encroached upon the exit of the duct in the duodenum, which gradually dilated the gall-bladder and gave symptoms of gallstones. I cut down upon the enlarged gall-bladder, and from the gall-bladder we obtained about four ounces of pure pancreatic fluid. The patient died from the carcinoma. A post-mortem examination was obtained.

Dr. Cartledge (closing).—I would call attention to the fact that we had these peculiar yellow bodies in this cyst on the under surface, to which Dr. Mayo has called attention. These I could feel with my hand in the bottom of the cyst, because I apprehend I could feel the peculiar condition of these yellow deposits which were in the wall of the cyst.

THE CURSE OF GONORRHŒA.

By Joseph Taber Johnson, M.D.,
Washington, D. C.

While many diseases, both medical and surgical, have been shorn of their terrors by the discoveries and advances of the nineteenth century, very little seems to have been discovered to prevent the complications which constitute the curse of gonorrhœa. So many sad cases of pelvic disease of specific origin are constantly coming under the care of those in charge of the female clinics in the dispensaries and in the gynecological wards of our public hospitals that it is almost impossible to overestimate the importance of this subject.

The evidence is indisputable and overwhelming that many women lose their lives annually from the pelvic inflammations caused by these complications, and that thousands probably lose their health, or their power of conception, from the same cause. One reason for these sad results may be inappropriate treatment by unskilled persons and the too early discharge of patients of both sexes, as cured, when they are still able to infect others. Another important point for us to consider is that this disease and its dire effects are not confined to the debased, criminal, and outlaw classes of society, but it too frequently wrecks a home and destroys an innocent and valuable life in the highest walks of society.

Innocent brides have had their lives ruined by marrying supposedly healthy husbands who honestly thought themselves cured. While there are two great wrongs committed

in a case of this kind, it is quite possible that the greater wrong has been done by our own profession in giving an opinion, either through ignorance or carelessness, that the patient was so far cured that it was perfectly safe for him to marry.

From the best statistics I have been able to obtain, there are 300,000 women in this country leading lives of prostitution, and the estimate is made by health officers and the superintendents of police in thirty large cities, who make reports on this subject, that for every woman who regularly resides in a house of ill-fame, there is at least one, if not more, just as bad who never, or rarely, becomes known to the police. This will give half a million at the lowest estimate of candidates for this disease in our country alone. Take the world at large, as we do in estimating the probabilities in other diseases, such as cholera or the plague, and the women in the world who have this disease to-day, or are liable to have it to-morrow or next week, may fairly be reckoned by millions. I learn that the average length of life of these women is only five years from the time they begin a life of prostitution, and that 40,000 of them die annually. While some die from the effects of dissipation and the ordinary diseases incident to humanity, it would seem fair to assume that from 30 to 50 per cent. die annually from the effects of gonorrhœa. I think Bland Sutton, of London, is correct when he gives gonorrhœa as the chief reason of sterility of the prostitute class. A gonorrhœal salpingitis, whether it goes on to suppuration and the formation of pus tubes and ovarian abscesses or not, frequently destroys the epithelial lining of the tube and so cripples the ovary as to render conception next to impossible. Sterility is, then, a very common, if not a universal, legacy inherited by the female victims of this disease.

"The chief danger of gonorrhœa in the female is the infection of the uterus and uterine appendages." "Gonorrhœa is the chief source of salpingitis and pelvic peritonitis." Among other complications may be mentioned:

inflammation and suppuration of the vulvovaginal glands, urethritis, cystitis, ureteritis, pyelitis, nephritis and pyonephrosis, proctitis, endocervicitis, endometritis, salpingitis, ovaritis, tubo-ovarian abscesses, pelvic peritonitis and general peritonitis, paratubal, ovarian, and uterine inflammations, puerperal complications, and very destructive infantile ophthalmia.

It may also attack serous membranes and fibrous tissue, synovial sacs, bursa, tendon-sheaths, the peritoneum, pleura, and the pericardium. Familiar illustrations are gonorrhœal rheumatism and ulcerative endocarditis. The peculiar germ of gonorrhœa may reach near or distant parts of the body through the lymph and blood streams and may penetrate the tissues and produce suppuration and cause glandular adenitis, especially in the inguinal region.

The frequency of the occurrence of these important and dangerous complications cannot be stated in exact percentages, as the experience of surgeons and writers differs. Those in free dispensary and charity hospital practice will see many more of these sad cases than those who are doing a private practice only, among the better class of patients. But even these are too frequently innocent victims of accidental occurrences. Thus Sanger announces "that 25 per cent. of his hospital and private patients have gonorrhœa." Lomer found the gonococcus in 60 per cent. of the cases in Schroeder's clinic. One observer places the average as high as 80 per cent. Lawson Tait, in a conversation on this subject, told me that quite a good proportion of his abdominal operations were on account of the complications of gonorrhœa, and Dr. Williams, of Philadelphia, in a paper read to the Association of Obstetricians and Gynecologists, a few weeks ago in Washington, stated that over 90 per cent. of the abdominal sections in his city were required on account of the complications of gonorrhœa. Dr. Robbins, professor of genito-urinary diseases in one of our medical colleges, tells me that he believes that one-half the abdominal operations performed upon women throughout the world

are caused by the curse of gonorrhœa. In an article in the *Maryland Medical Journal*, January, 1899, on "The Gonococcus of Neisser," he quotes on page 6 of his reprint from German statistics to show that 23 to 28 per cent. (while English and American statistics show, he says, 70 per cent.) of all cases of adnexial disease are due to gonorrhœa.

All prominent modern authorities agree that the two chief causes of suppurative and destructive inflammation of the female pelvic organs are puerperal sepsis and gonorrhœa. Some name one of these first and some the other. Of the two, the specific cause is more destruction of function than the septic. If a patient recovers from a serious pelvic inflammation of septic origin, she is more likely to fully regain her health, and have other children later on, than when the cause is specific. Relapses occur from the latter cause and sterility is the usual lot of all women who have once suffered from gonorrhœal salpingitis.

Since Noeggerath wrote his philippic on "Latent Gonorrhœa," in 1876, there has been much discussion, much investigation, many denials that he was right, and many misgivings lest he might be. Quite a storm was created by his assertions that many cases of gonorrhœa in the male were never cured—that the disease remained latent for months and years; in other words, that a virulent poison remained behind a stricture or existed in a gleety discharge, which was capable, under the excitements and possible excesses of newly married life, of re-exciting the disease in himself and infecting the innocent and unsuspecting wife he had so lately promised at the altar to love, cherish, and protect.

Dr. A Palmer Dudley, of New York, in a paper on "Chronic Gonorrhœal Infection," read before the American Gynecological Society, in 1897, quotes from an article by Dr. Lyons, a New York microscopist, published in the *Medical and Surgical Bulletin*, May 1, 1895, in which he says: "Notwithstanding all the facts which have been accumulated in the study of this disease in both sexes, in

the last few years, it is a most lamentable truth that there is no disease, at least of such common occurrence, that is so little understood; the diagnosis of which is so often missed, so much neglected, and so improperly and unsatisfactorily treated by the vast majority of the profession," and, according to his experience, he says he must include even gynecological specialists. So you see, we are considered no better than the rest of the profession, in a department of medicine where we are supposed to excel. Dr. Dudley says such has been his own experience.

In 1897, Dr. Cushing, of Boston, read a paper on the "Sociological Aspects of Gonorrhœa," in which he urged the great and increasing importance of the effects of "latent gonorrhœa" upon the health and growth of nations as well as individuals. He says "that although its full importance has only become apparent *within the last few years*, yet we cannot doubt that for ages this disease has acted in the same way, and, if time permitted, I could trace the connection of its influence, with the historical facts known, as to the degeneration and disappearance of conquering races, when subjected to the influence of older and more corrupt civilizations, as well as to the decline and fall of successive empires and peoples."

The power of the gonococcus to infect another after an indefinite period, from the acute attack, has been denied by some, but instances are not infrequent where the most disastrous results have followed the marriage of supposedly cured husbands, months after all pain and discharge had ceased. One of the chief, and to my mind most important, points for discussion in this paper is when, if ever, may we give our professional sanction to the marriage of a man positively known to have had this disease, and our professional assurance that the trusting and innocent wife will be absolutely free from any danger of infection?

It is probably within the personal knowledge of every doctor in this room that wives have been infected with this disease by ignorant or careless husbands. In some in-

stances these men have been assured by their physicians that they were cured beyond the danger of transmitting it to others. This assurance has been construed into a professional sanction of matrimony. He may not have thought when he gave this opinion that these gonococci were lying back behind a deep and only partial stricture, ready to spring into deadly activity upon the occurrence of venereal excitement or sexual excess. The doctor himself may not have known what we have the most abundant authority for stating now, namely, that (Dudley's *Gynecology*, second edition, p. 155) "the chief power of gonococcus for harm lies in the lasting vitality of the germ *after apparent cure.*" "The gonococcus may remain inactive in the mucous crypts, liable at any time, even while quiescent in the individual, to be communicated to another." Hence, many an innocent and previously healthy woman, shortly after marriage to a man who supposed himself to have been cured of gonorrhœa years before, may, by contact with the attenuated virus, get a destructive gonorrhœal infection of her genito-urinary organs.

Recent experiments of Wertheim are quoted in Dudley's *Gynecology*, p. 155, third edition. He reports that human serum agar is the best culture ground for gonococci. In this culture at 40° to 43° C. they retain their full reproductive capacity. A direct experiment from pure culture from a gleety discharge of two years' standing gave the following interesting results: 1. Attempted reinfection of the original urethra with this culture was always a failure. 2. The culture when transplanted to a coccus-free urethra produced typical acute gonorrrhœa. 3. Infection from this back again to the original urethra gave a fresh gonorrhœa, which, after a typical course of five or six weeks, again subsided into a chronic gleet. Thus by passing the gonococci through another individual—that is, through a new culture ground—they become again virulent to the urethra which was invulnerable to them before.

This explains the fact that an apparently healthy subject

of chronic or latent gonorrhœa may infect his hitherto uninfected wife and become infected from her. That is, the gonococci passing through the new culture ground of the wife again became virulent for the husband. We can now understand why the gonococci, even after years of apparent cure, may regain its full virulence. This germ may be found in the uterus and tubes long after it has disappeared from the vagina. The crypts of the uterine mucosa furnish a ready resting-place for the gonococcus. It may for long periods remain concealed in a quiescent state, a menace to health and to life itself.

A prominent gynecologist author writes as follows on this subject: "Why do large numbers of apparently healthy women date their pelvic infection from the marriage week? Is it, as one author declares, 'the fatigue and excitement of the wedding journey?' Why do so many women with perfectly developed reproductive organs remain sterile from the time of marriage, or after the birth of a single child and a dangerous 'childbed fever?' The causation of too many such cases of hopelessly diseased uteri, tubes, and ovaries, not to mention proctitis, with sometimes rectal stricture, urethritis, cystitis, pyelitis, and nephritis, has been explained by the word 'idiopathic.' Their histories, if written, would often tell of an apparently cured gonorrhœa, before or after marriage, in the husband. If the most destructive infection may follow contact with a subject of gonorrhœa after the discharge has ceased, how perilous must be the slight gleety discharge so often disregarded."

In December, 1893, Dr. T. Gaillard Thomas read a paper on the "Chief Factors in the Production of the Diseases Peculiar to Women," before the New York County Medical Association. Dr. George Tucker Harrison, in the discussion, spoke of the *curse of gonorrhœa* as one of the most common and potent factors. He asserted that Noeggerath's position on latent gonorrhœa, taken many years ago, had been fully vindicated. The dangers to the wife of latent gonorrhœa were great. It was more dangerous to a woman

for her husband to have gonorrhœa than syphilis. A sad instance was related of the marriage of an attractive young girl of nineteen years to a widower of thirty-five years, followed soon by backache, prolonged menstruation, pelvic pain, fever, mètrorrhagia, endometritis, salpingitis, oöphoritis, peri-oöphoritis—then contraction by accident, of course—of gonorrhœal ophthalmia, and the loss of one eye. How often do we see young women entering upon marriage have their bright hopes of offspring blasted by a latent gonorrhœa in the husband. The almost constant results of gonorrhœa in women are ill-health, sterility, and hysteria.

In the fall of 1899 I was requested by a medical friend to see a young lady, who had been married only one month, who was suffering from a severe acute pelvic inflammation. An operation was decided to be necessary to save her life, and she was taken that day to the Georgetown University Hospital, where, on the following day, I was compelled to remove two large pus tubes and also the infected ovaries. The disconsolate husband gave me the following history: Several months before marriage he had contracted gonorrhœa, for which my friend had treated him. Finally, when all symptoms had disappeared, pronounced him cured, and he, a few weeks later, "committed matrimony." After the first week of married life his symptoms all returned and he did not hesitate to state that he must have unfortunately infected his wife, as she had symptoms very similar to his own. He was heart-broken over the calamity and freely asserted that if his wife died he would blow his brains out. He was very bitter against his medical adviser who had pronounced him cured.

I have in the same hospital two young women who have been operated on this month for gonorrhœal pus tubes, and am now treating a young lady, aged twenty years, who was married four years ago. She was taken with a severe "womb disease," as she called it, very soon after marriage. She gradually grew worse, was in bed two months, suffered

terrible pains in the lower part of her abdomen, took a great deal of morphine, and finally got able to be about again. This lady had no idea at the time of her illness, of its cause, but a year ago her husband confessed that he thought when he was married that he was entirely cured of a gonorrhœa which he had contracted more than a year previously. His physician, he said, had not only pronounced him cured, but had assured him that it was perfectly safe for him to marry, and that there was no danger of his communicating the disease to his wife. Within a week after marriage his symptoms all returned, and she became infected, with the result above stated. She has now a divorce from him. She is a physical wreck, as well as a broken-hearted woman, at the age of twenty years. Through her four years of married life she had never been pregnant.

Dr. Tyner, now of Washington, but until recently a resident of Texas, informs me that he was in charge of a blind asylum in that State at one time, and that his records show that there were under his care 1700 cases of blindness. Six per cent. of these had their eyes destroyed by gonorrhœal ophthalmia among the white patients, and 18.7 per cent. of black children were blind from the same cause, making 24.7 per cent. in all.

There were in the United States, according to the last census, more than 50,000 blind persons, and the average percentage of the blindness caused by ophthalmia neonatorum is more than 25 per cent. (it varies from 15 to 50 per cent. in various statistics). We are certainly within the mark in assuming that 15,000 of these blind persons lost their sight from neglected sore eyes in infancy. Taking the cost of maintenance of a single person, according to the statements of our best regulated asylums, as, at the least, $132 a year, and the average net earnings of a single able-bodied person at $1 a day, we find that the total loss to the commonwealth of the United States from the ravages of this disease reaches the sum of $7,500,000 annually.

This point would seem to be equally true in regard to

all the other complications of gonorrhœa. Had this disease been cured in its acute stage none of these complications would have occurred and much suffering and untold sorrow been prevented.

The present King of England once said, when, as Prince of Wales, he was presiding at a meeting at the opening of a new hospital for the treatment of preventable diseases, that he could not quite understand why the preventable diseases to be treated in the grand and costly structure they were about to throw open to the suffering public were not prevented? Very many of the laity are also harping on this point, and, as they are constantly becoming more intelligent upon matters medical, surgical, and hygienic, an increasing number of very intelligent people are asking the same question which the Prince of Wales so pertinently asked—that is, Why are the preventable diseases not prevented?

An answer comes from one special department in medicine in Norris and Oliver's recent *System on Diseases of the Eye*, in which Dr. Swan M. Burnett says, on page 198, vol. iii.: "Like other forms of purulent conjunctiva, it, too, is one of infection, and, except in rare cases, from one definite source." Dr. Burnett does not contend that every case of ophthalmia neonatorum is of gonorrhœal origin, but he does say "that the infection comes from the vagina of the mother almost without exception, and that this is proved by the measures that have been instituted for its prevention and cure, the success of which is one of the greatest triumphs of modern scientific medicine."

If the ophthalmologists can prevent the occurrence of 15,000 cases of blindness annually, and a yearly loss of $7,500,000 to the commonwealth, it would seem to be very natural to ask why the general surgeons and the gynecologists cannot prevent the occurrence of so many thousands of pus tubes, ovarian abscesses, and abdominal sections from the same cause.

Preventive medicine will probably rank the highest

among the medical achievements of the twentieth century. The wonderful results obtained by the improved technique and practice of modern antiseptic surgical methods, especially in the abdomen, mark the past century as one of the most remarkable in the entire history of medicine.

It is to the prevention of serious infections by the gonococcus of Neisser that I appeal to you and through you to the great profession of which we are all members.

No more important question, I fancy, presents itself for consideration in the entire realm of practical or preventive medicine than this: When can we professionally sanction the marriage of a man known to have had gonorrhœa? Can we say at the present time when a man is cured?

Drs. Keersmecker and Verhoogen in their book published last year on *Chronic Urethritis of Gonococcic Origin,* intimate that we cannot. They say the gonococcus may remain in the canal during the course of a chronic urethritis, that is to say, during an indefinite time. Its virulence may then become attenuated, and only show itself by the invading character of the lesions and the obstinacy of the disease. It may also begin again after a period, and thus give to the affection the acute or contagious character which it had seemed to have lost. It is impossible to determine at what moment, the gonococcus having disappeared, the disease ceases to be transmissible.

And again, "When these facts will become better known to the profession, auto-reinfection by gonococci permitted to become latent in the deeper structures will become a rarer event, and the prognosis of gonorrhœal infection in both sexes will be a more hopeful one."

In the chapter on "Chronic Gonorrhœa and Marriage," they say: "No doubt there is ample ground for the pessimistic belief of Behrand and his followers, that gonorrhœa is practically incurable, especially in the female, and they raise and emphasize the question as to when we may pronounce a gonorrhœa cured? Nothing short of educating the masses to the perception of the great social danger

which lies in an attack of gonorrhœa will mitigate its ravages and save hecatombs of wrecked lives in both sexes, but especially in women."

That this subject is attracting more attention of late is evidenced by the favorable reception of Jullien's monograph upon *Libertinism and Marriage*, which has been honored by a translation into English and German, and also by the three annual sessions of an international congress of genito-urinary specialists.

Valentine and his associate, Dr. Thompson, in New York, have written with persistence and force of the difficulties in the way of a permanent cure and the scientific methods of diagnosis of latent chronic gonorrhœa.

Prof. Valentine says among other conclusions, in a paper read to the New York Academy of Medicine, April 17, 1901:

1. That an apparently fresh outbreak of gonorrhœa is no proof positive of a new infection.

3. That treatment can be effective only on discovery of the site or sites where gonococci are resident.

8. That when the urine has become macroscopically clear it by no means indicates the patient's freedom from gonococci.

11. That precise diagnosis is obtainable only through the urethroscope; and

12. May require completion by the microscope.

17. That fissures at the meatus may possess gonococci.

The point, however, which I wish to lay the greatest emphasis on, is, that we make ourselves much more certain in the future than we have done in the past that our patients of both sexes are absolutely cured beyond the danger of a relapse before we dismiss them from further observation, control, and treatment. Our female patients should be so vigorously treated as to prevent, if possible, the extension of the disease beyond the vagina and the external parts. The question of "latent, chronic, or residual gonorrhœa," and its possible disastrous consequences, should be

more constantly in mind when we are treating these cases, and our management should be so radical, thorough, and complete as to prevent the occurrence of pelvic infection and adnexal complications. These cases should no longer be left to the care of drug clerks, medical students, and irresponsible persons to treat. Some hospitals still refuse, I am informed, to admit venereal diseases, and some physicians regard it as beneath their dignity to attend them. Patients are compelled, not infrequently for this reason, and also on account of the high charges of good physicians, to consult unskilled persons and the advertising quacks. One of the consequences of this unwise course is that they are only half cured, and the patients with this disease are permitted to go about thinking themselves cured, and some of them will undoubtedly contaminate innocent persons. Not a few writers, in the light of advanced modern science, speak of gonorrhœa as being a more serious disease than syphilis, especially in women. The day has gone by when it can be said, as we have all probably heard it said, that gonorrhœa was less to be dreaded than a bad cold, and that the well-advertised "three days' cure" would render the care of regular physicians unnecessary, etc. The difficulty of a perfect cure has been recognized and emphasized by the most skilled specialists in this department of medicine. It is stated of Ricord, the distinguished French specialist and author of a treatise on *Venereal Diseases*, that, at a dinner in Paris, when the speech-making time arrived, he, among others, was asked by the toastmaster to state his view of the punishments of hell that would be meted out to the unfortunate sinners who should be sent below. His reply was brief and to the point. He said that no greater punishment could be meted out to him than to be compelled to review the procession and to hear the accusations of those he had failed to permanently cure of gonorrhœa. Our consciences, as well as our treatment, need revision in regard to the dismissal of gonorrhœal patients as cured so absolutely and permanently as to make

marriage safe beyond the possibility of the contamination of the innocent wife. How long after the gonococcus ceases to be found by the microscopist in the urethral secretions or discharges can we safely give our professional sanction to matrimony? This is one of the burning questions of the day and should be considered with the greatest care and conscientiousness. Dr. Joseph Price says there are more and better reasons for locking up in jail a man with gonorrhœa than there is to incarcerate a common murderer. In one case there is only one victim and that victim is dead; in the other there may be a dozen or more, doomed possibly to suffering and sorrow during the remainder of their miserable lives.

If the ophthalmologists can reduce, as they now claim they can, 25 per cent. of the blindness of the world to a fraction of 1 per cent., why cannot we, I ask again, by equally thorough and early preventive treatment, stamp out the curse of the gonorrhœal complications referred to in this paper?

DISCUSSION.

Dr. Virgil O. Hardon, of Atlanta, Ga.—I am of the opinion that before an audience like this no discussion of this subject is necessary. As a matter of course, there can be but one view held by all men who have had the opportunities of constantly treating diseases of women, in regard to the results of gonorrhœa. Since the time when Noeggerath advanced his views, which were then considered doubtful in the minds of many, the attention of every gynecologist has been directed more or less to this subject, and as a result of the thought and study which have been given to it there can be but one conclusion in the minds of all. For me to discuss this question would be to reiterate what Dr. Johnson has said, would be to express views which we all hold, but still there is one point with regard to it that I would like to mention. It seems to me that there is a tendency on the part of those who largely treat cases in hospital practice to exaggerate the importance of gonorrhœa as a cause

of pelvic diseases in women. Any man who does a large private practice, and, at the same time, who does a large charity hospital practice, will be impressed frequently with the difference in the class of cases which present themselves to him in these two different classes, and I believe that the difference between the two classes of cases lies in the greater prevalence of gonorrhœa among that class of subjects who come to us in charity hospitals. The difference does not lie in the class of diseases we meet with, but in the virulence of those diseases, and I think we should make a distinction between the two, and not confound these cases with those which come to us largely in private practice. Not that in private practice we are free, by any means, from the results of gonorrhœa, not that gonorrhœa is confined, by any means, to the lower classes; but I think, if we make this distinction, we will realize that in private practice there is quite a large proportion of cases of inflammatory diseases of the tubes and ovaries in women which are not due to gonorrhœa. We see them in women who have not been exposed to the possibility of a gonorrhœa. While it is true that salpingitis is comparatively rare in virgins, yet it does sometimes occur. Inflammatory diseases of the pelvic cellular tissue, pelvic peritonitis, ovaritis, occur in women who have not been exposed to the possibility of the contagion of gonorrhœa. And so we have to look at the other side of the question, and not be led to believe, as some would have us believe, that the existence of a purulent salpingitis is necessarily to be traced to a gonorrhœal contagion. Growing out of that view there is a point which has been deeply impressed upon me, and which, it seems to me, has not been sufficiently emphasized by those men who write and talk on this subject, and that is the difference in the results which follow palliative treatment or non-operative treatment, I should say, in all cases of pelvic inflammation which are not due to gonorrhœa, as compared with those which are due to gonorrhœa. While it is true, as a surgical principle, that pus in any part of the body should be removed as soon as it is detected, yet there is a considerable class of cases, in my experience, mostly in my private practice, more rarely in my hospital practice, of salpingitis which permanently yield to non-operative treatment. I believe this fact is largely lost sight of by men who are doing a great deal of surgical gynecology; that there is a considerable class of cases of inflam-

mation of these organs which will yield to non-operative measures, as do inflammations of mucous membranes in other parts of the body. I have repeatedly seen satisfactory results follow non-operative measures, and the longer I practice a specialty (and my practice is entirely limited to diseases of women), the more I am convinced that satisfactory results can be obtained by non-operative measures, strictly speaking, in many cases. In those cases not due to gonorrhœal infection we may in quite a number of them relieve the pelvic inflammation by non-operative measures, and restore the patients not only temporarily, but permanently and completely, to health. I speak of this subject because I believe it is one which has not impressed itself upon the profession to the extent it should have done, and my belief is founded on what I have heard said by specialists in medical societies and from what I have read in books written by such specialists.

Dr. A. Palmer Dudley, of New York City.—In the time allotted to me it would seem impossible to say anything that would touch upon the real subject of this paper, that is, What can we do to prevent the spread of gonorrhœa? and how far can we go in our professional opinion toward those who spread the disease? What limitation can we put upon the condition prior to marriage? That is a question, in my judgment, still left for the future.

In discussing this subject I must speak of it from both standpoints. In the first place, it is my belief that in the major proportion of cases the woman is entirely innocent. She neither knows, neither does she want to know, that she is a victim of such a disease. We must look to the male for the major portion of infection. Now comes the question, What is the primary origin of the gonococcus? I do not think, as yet, pathologists have given us a perfect knowledge of the primary origin of the gonococcus, otherwise we could easily trace the first infection to the male, because in our clinics we can reach the opposite sex, and it is a fact, according to my professional experience, and so far as I know, that there is a sexual cause for it other than contact. I have studied this subject carefully, and did time permit I could relate cases to you that are on record in my books where an innocent man has had intercourse with another man's wife, the wife having had intercourse with her husband a few hours previously, and the villain in the play got the gonorrhœa, while the husband escaped. Now, where

is the origin of those cases? I want to go back to first principles. It must come from some sexual excitement other than the mere contact.

Another question may be brought into this discussion in relation to the paper, and that is this: A man may have gonorrhœa half a dozen times, and so long as the gonococcus does not penetrate the urethra back of the anterior portion, so-called, into the deeper or muscular urethra, he will not become infected if the gonococcus has disappeared from the secretions. It is when the gonococcus lodges in Cowper's glands that it remains, ready to be revived. It is when the gonococcus lodges in Skene's duct of the urethra in women that it revives. So far as the woman is concerned, and the preventive measures in her case, I want to shield her, if I can. Take women in the filthiest walks of life, and they do not have gonorrhœa unless they contract it from contact with something in which living gonococci are readliy implanted, and the disease may be transmitted to children. There are undoubtedly dozens of cases of gonorrhœa in children transmitted by contact; but if you leave these women alone they may live and never know that they have been infected with the gonococcus.

Dr. Williams, of Baltimore, will tell you that the major portion of women he has examined have vaginas that are sterile, and so we have not gotten at the real origin of the gonococcus, and I leave that question open for discussion.

Dr. Hermann J. Boldt, of New York City.—I think we will all recognize that an acute gonorrhœal infection in a woman is not dependent upon infection which is produced by the latent form of gonorrhœa, but rather that it is produced by the acute form. In other words, as Dr. Hardon has said, it depends upon the virulence of the gonococci. As a matter of fact, I think that we are, most of us at least, in a position to state that the so-called latent form of gonorrhœa does not produce an acute gonorrhœa in a woman; it does not produce the acute forms of suppurative tubal disease, but it produces other forms of tubal disease which we know as chronic inflammation, chronic forms of tubal disease.

The question of most importance to us is the prevention of gonorrhœa. While I am not in a position to advise the measures which one should take to prevent gonorrhœal infection, I am sure that the general practitioner and those who practice

genito-urinary diseases as a specialty are in a position to prevent gonorrhœal infection so far as the male is concerned. It has been my habit for a number of years, if I have a woman who is suffering from gonorrhœal infection, if by good chance we are able to get her well of that infection, to have the husband examined by one who is competent to make such an examination, and I maintain that general practitioners, as a rule, do not pay that attention to such examinations that they should. I find those who practice genito-urinary diseases as a specialty use different and more tests for making such examinations. In the first place, the patient in whom gonorrhœa may be suspected (latent gonorrhœa) is put on an alcohol treatment. He is subjected to taking sufficient alcoholic stimulants to bring about an inflammation of the urethra, and then an examination of the secretions which may be present is made, if such an inflammation is brought about. Secondly, the urethroscope has been mentioned, and secretions from suspicious parts of the urethra should be taken and examined microscopically. Third, the male organ is subjected to injections which should produce inflammation of the urethra, and then the secretions which are formed as the result of inflammation should be examined. I maintain that if there is any test which will bring about an inflammatory condition of the male urethra, which will then show an absence of gonococci upon microscopic examination, then and only then is one in a fair position to assume that such a person is a fit subject, as Dr. Johnson has said, to commit the act of matrimony. I believe that is one of the steps which every physician should take into consideration before he gives his sanction for a man to undertake matrimony, and that under such circumstances, if no gonococci can be produced from the male urethra, then should one be permitted to sanction matrimony.

Dr. Hugh H. Young, of Baltimore.—While I can offer no gynecological experience, I wish to say a few words upon the other side of the question. The gonococcus has little or nothing to do with it (the diagnosis). I have seen many a case of chronic gonorrhœa that has been studied most carefully, in which the gonococcus has never been found, and yet the husband has infected his wife. I may mention a case that a Cincinnati practitioner told me about to-day—a patient who was under my treatment for some time, but later passed out of my hands when he went to Cincinnati. Last May he con-

sulted me with reference to marriage. He said that he had no discharge and that he was well. In the morning urine I found a few shreds which were composed, microscopically, mostly of epithelial cells. There were very few pus cells present, and no gonococci to be found. His prostate was absolutely normal. I gave irritating injections, but was unable to find any gonococci. I told him to come back again, wishing to make further cultures, but he did not do so, and got married without awaiting my consent. I now learn that two or three weeks after marriage he had a return of the discharge, but that it soon subsided or disappeared completely, but that his wife became infected, and numerous gonococci were found in her urethral discharge. So I say the gonococcus has very little or nothing to do with the diagnosis of cure. We cannot be sure of the nitrate of silver and of the other tests. We have a great and grave problem here to contend with, I believe; a great many times we must tell patients who are apparently well, who have no discharge from their urethras, who pass only a few shreds, that they cannot get married, regardless of how much we would like to see them marry the women of their choice. It is a difficult problem and one that has not been settled. We can certainly not give permission to marry simply because we find no gonococci.

I know of a case in Baltimore—a man who was treated by an excellent practitioner for three or four years. The patient put off his marriage for two years, and finally the doctor, after examining him carefully with cultures and cover-slips before and after irritating injections, and finding no gonococci, told him that he could safely marry. Six weeks after the wedding his wife was brought in with acute tubal disease and peritonitis, requiring laparotomy and salpingectomy. No gonococci were found in the tubes. The man was sent to me for examination; I took cultures, found the staphylococcus albus, but no gonococci.

So the gonococcus has nothing to do with it. The sooner the medical profession realizes and makes known that the absence of the gonococcus does not mean that a man can get married, the better it will be both for the medical profession and for the laity. There is no question about that.

Dr. Robert T. Morris, of New York City.—Dr. Young has ignored in his remarks the question of cell resistance of the individual. This is a question for the pathologists to discuss,

and not for me. But when we have a colony of bacteria latent in the epithelium, they may be present abundantly, and yet not be proliferating. A patient who is strong and well, who has had gonorrhœa, may have latent colonies of gonococci perfectly well developed in the epithelium. These gonococci may spring into activity at any moment the man loses his cell resistance. For instance, if he has an acute pharyngitis, it may be the means of causing the gonococci to become active; then they proliferate, and he can then infect a person. A man who has had gonorrhœa, throwing off shreds of desquamating epithelium, with latent colonies of bacteria in the epithelium, may not show a single gonococcus on microscopic examination, and yet after perhaps a little excess, such as sometimes occurs in the early days of married life, the gonococci, which were certainly absent so far as the microscopist could discover, spring into activity, become proliferating colonies, ready to infect the wife.

As to the final disposition of gonococci, it is a matter in which we are dealing with the cell resistance of individuals. I have examined patients whom I knew presumably had distinct gonorrhœal infection involving the adnexa, who, years afterward, came to me for operation for various complications common to gonorrhœal infection of the adnexa. I found adhesions, diseased ovaries, closed tubes, and in examining these I found that no gonococci remained. Those are the cases in which the gonococcus had been overcome, probably, by the leucocytes or by phagocytosis at a time when the patient was carried to the point of preliminary good health by good local and general treatment. We know that in cases of gonorrhœal rheumatism, so-called, most of the responsibility for disasters is due to the fact that the patients were treated for rheumatism. If these patients are treated by a method which increases their leucocytosis, which develops normal cell resistance, they will recover from the most extensive gonorrhœal septicæmia or so-called rheumatism, so that eventually the cure of cases of widespread infection by the gonococcus is largely a matter of dealing with the question of cell resistance of the individual.

The matter of latent gonorrhœal infection, to which Dr. Young referred, in which no gonococci were found, is a matter of latent gonococci due to cell resistance of the individual.

Dr. Dudley's point, as to where the bacteria come from is another matter of cell resistance of the individual. The

husband may have latent gonococci, or there may be a latent friend in the case; in any event the gonococci were there; they were not developed *de novo*. We must realize that gonococci may be present and are not proliferating. They must have been present originally, and it is not for us to say where they came from, but we must rest content with the knowledge of the fact that they were there.

Dr. Charles P. Noble, of Philadelphia.—It is hardly worth while to dwell upon the importance of this subject, because it goes without saying that we all concede it. I would like to say a word or two regarding one point raised by Dr. Hardon, as to whether a large percentage of gonorrhœal tubes recover spontaneously or under treatment. I have seen a large number of cases of septic infection after childbed where the tubes became normal under medical treatment, but not when the infection was due to gonorrhœa.

As to the other subject which has been touched on prominently to-day, I think the trouble is we have so few well-observed and well-studied cases. Cases of the kind alluded to by Dr Young are the ones which we must have in order to get an accurate idea of the question. I will report two cases exactly similar to those seen by Dr. Young. These cases also show that the views of Dr. Boldt are not without exception. The two cases of Dr. Young of a virulent acute condition arose from so-called latent gonorrhœa, and in the two cases I will report acute gonorrhœa was caused from latent gonorrhœa. These two cases had gonorrhœa and were treated by an expert in genito-urinary diseases. Both of these men were told they were cured, and finally got married. It was over a year after the supposed cure before the question of marriage came up. They went back to the physician, who re-examined them carefully, both of them having been told they were perfectly well. Within a month after marriage the wife of one of them had a pus tube, and the other salpingitis and peritonitis. I removed the appendages from both women. I feel at the present time that I cannot tell positively when a man is cured of gonorrhœa, and I would not be responsible for telling any man he could get married with absolute safety if he had ever had gonorrhœa. There is no way at the present time to tell that, so far as the man is concerned, and it is probably equally true of the woman. The sooner we amass a number of cases of this kind, carefully and thoroughly observed, so that we can form an intelligent

opinion, the better it will be. There is needed greater care in treating patients. The longer marriage is put off the less risk there is of conveying gonorrhœa. So far as I know, at the present time we have no means of positively telling men or women who have had gonorrhœa that they are well.

Dr. Hardon.—I wish to correct what appears to be an erroneous impression on the part of Dr. Noble. I do not mean to state that the gonorrhœal cases can be cured in the manner indicated, but that there is an important and quite obvious distinction between cases that are not gonorrhœal and the more virulent cases which cannot be cured by ordinary treatment.

Dr. Boldt.—Dr. Young and Dr. Noble both made the assertion here that several patients were examined in whom the diagnosis of acute gonorrhœa was made, and yet no gonococci were found either in the male or the female. I would like, as a matter of information, to know on what basis the diagnosis of gonorrhœa was made? We must recognize he fact that the diagnosis of gonorrhœa must be made on finding the gonococcus.

Dr. J. G. Sherrill, of Louisville.—I do not believe it is wise to make the statement, without qualification, that because we find no gonococci in the secretions from the urethra the patient has no gonorrhœa. I do believe, however, that the demonstration of the presence of this germ is necessary to make the diagnosis. In the chronic cases we frequently find gonococci absent; in other words, we cannot get them out of their interior connection with the tissues and demonstrate them by the microscope. I recall to mind one case which recently came under my care. I was called to see a young woman, aged seventeen years. Her family physician had made a diagnosis of gonorrhœal salpingitis. I examined the vagina carefully at that time; it was not inflamed, but greatly congested. There was no profuse discharge from the vagina. There was evidently congestion of the tube and ovary, which had taken blood away from the vagina and acted as counter-irritation and stopped vaginal inflammation. Examination of the secretions from the vagina showed the absence of gonococci. I was about to give the opinion that this was not a gonorrhœal infection, but, fortunately, I did not do so, but held the question open. The process was very acute; so acute that I was of the opinion it was unwise to open above the pubic bone, therefore I drained

from below. The pus from the abscess showed gonococci. This illustrates that we may have a virulent gonorrhœal process, and yet be unable to demonstrate the presence of the germ in the secretions from the urethra or vagina.

The point brought out by Dr. Morris, that these germs may lie in certain portions of the genito-urinary tract, and cannot be demonstrated in the discharge at certain times, is an excellent one. Failure to find gonococci in the secretions from the vagina or the urethra of the male is not positive proof of the absence of the disease. I agree with Dr. Young on this point, that we cannot make a positive statement as to communicability of the disease by demonstrating the absence of the germ. We must have the germ present in order to have gonorrhœa in every case.

Dr. Alexander Hugh Ferguson, of Chicago.—There is one point which has been overlooked in connection with diagnosing latent gonorrhœa, and that is to get the patient to ejaculate and empty the vesiculæ seminales, and make a microscopic examination of the fluid. I would suggest that Dr. Young do that in his cases before he says positively that the gonococcus has nothing to do with gonorrhœa in these cases.

Dr. Young.—I have been misunderstood. Of course, I did not mean to say that the gonococcus is not the primary cause of the disease. Not at all. Gonorrhœa requires the presence of the gonococcus to produce it, and even in chronic cases it is probably present. I meant to say that because we do not find the gonococcus in the secretions we must not say that the patient is cured, even when there is no discharge present. The prostate and vesicles and their secretion obtained by massage, and the shreds found in the urine, must be examined carefully, and if we find pus cells present, although no bacteria are seen, the patient cannot safely marry.

Dr. Johnson (closing).—The first and chief point of my paper for discussion is, When can a man who has been known to have had gonorrhœa safely marry? That question has not been answered, except to say that it is impossible to state when a man is so sufficiently and safely cured as to make one willing that he should marry into his family. The gonococci, all have agreed, may remain latent for many years, and then with the excesses of newly married life spring into activity and infect innocent women, who may in turn reinfect their husbands.

The second point was whether we could not, by the use of

preventive means, similar to those employed by the ophthalmologist in bringing 25 per cent. of the blindness of children down to a fraction of 1 per cent., prevent the ascending gonorrhœal infection from producing so many pus tubes and abdominal sections. One of the greatest necessities of to-day is to bring about this much needed reform in the practice of medicine, so it can no longer be claimed that more than one-half of the abdominal sections which we do to-day are the result of gonorrhœa. It is a shame to us all that this is so, and it ought not to be so. We ought to devote ourselves assiduously to the prevention of this ascending infection of the female pelvic organs.

There is a great deal which I should like to say on this subject. I am very much obliged, however, to those who have taken part in the discussion, and will take up no more of the valuable time of the Association, which the President admonishes us is required for the completion of the programme.

MOVABLE RIGHT KIDNEY AND CHRONIC APPENDICITIS.

By Walter P. Manton, M.D.,
Detroit, Mich.

Recent investigations in the morbid anatomy of the appendix cæci and increasing operative experience in the treatment of inflammations of that organ have advanced our knowledge in regard to a large number of hitherto obscure abdominal symptoms, but the etiology of appendicular disorders has not as yet been satisfactorily settled. The teachings of men of large clinical experience have rendered the diagnosis of acute appendicular disease familiar to the majority of practitioners, but the chronic form of the disorder, a process capable of giving rise to great discomfort and physical suffering, still remains to a large extent unrecognized, the afflicted individual often being subjected to a variety of treatments directed to nearly every abdominal viscus save the right one.

In this paper I desire to direct renewed attention to a condition which bears immediately on the etiology of this chronic form of appendicitis. In my experience nephroptosis is the most frequent cause of chronic appendicular disease. In 1894 Edebohls called attention to the frequent association of chronic appendicitis and movable right kidney, but, although a number of papers by the same author and others have since appeared, the profession has not yet learned to connect the two conditions. This is probably due to the fact that under these circumstances the classical symptoms of appendicitis are generally wanting, and also

because prolapsed kidney, unless of marked degree, is not easily recognized except by the expert.

While numerous statistics have already appeared relative to movable right kidney in women, I have thought it best at the present time to restrict my data to personal observations, and have, therefore, as a basis for deduction, gone over the histories of the last two hundred cases recorded in my note-books. These cases consequently are not selected, but represent the usual run of patients who consult the specialist for real or fancied ailments. Of the 200 cases, 73 (or 36½ per cent.) showed an abnormal mobility of the right kidney. This consisted of a downward movement, varying from one to three inches to a displacement into the right iliac fossa. Of these 73 patients, in 48 (or nearly 65½ per cent.) chronic appendicitis was also diagnosed. Eleven, or 22½ per cent. of this number came to operation, and thus served to confirm the diagnosis. Of the operated cases all were relieved symptomatically. Among the remaining patients either the condition was of too mild a type to demand immediate intervention, operation was refused, or the patient is now awaiting this operation.

From the foregoing figures it is evident that movable right kidney is a cause, the effects of which are manifested in a morbid condition of the appendix, and that the very frequent concomitance of the two conditions is not merely the result of accident. How this relationship is to be explained is more difficult of solution, and after careful study of the subject for several years I have found no better theory for its occurrence than that advanced by Edebohls, namely, that the movable right kidney compresses the superior mesenteric vessels between the head of the pancreas and the spinal vertebræ, thus interfering with the circulation in the appendix—at best a poorly nourished rudiment—and giving rise to congestion and subsequent inflammation of the organ. The symptoms produced by the combined conditions may be referred to the kidney, to the appendix, or to both, but in a large number of these

cases neither organ appears to be involved until careful examination shows it to be the seat of the trouble.

For determining the kidney mobility the examination may be undertaken with the patient standing, but, for the expert, the dorsal position with the legs flexed will be found preferable. The diagnosis of disease of the appendix is not always easy, and must be based on a thickening or impaired mobility of the cæcum or colon, and sensitiveness about the umbilicus or at any point from the normal position of the appendix downward and into the right iliac fossa. A pelvic examination in these cases is imperative, disease of the right appendages with thickening or adhesions running upward toward the cæcum almost invariably indicating involvement of the appendix.

Two points I desire to emphasize: 1. With obscure abdominal conditions, even when no pelvic disorder is discoverable, a diagnosis should not be attempted until movable kidney and appendicular disease can be excluded by careful abdominal palpation. 2. When nephroptosis and appendicitis are present, operations upon the uterus and adnexa alone will not be followed by cure of the patient unless one or both of these conditions have also been removed.

In regard to the necessity of anchoring the kidney and removing the appendix at the same time, this will largely depend upon the conditions present. In movable kidney of the first degree the ablation of the appendix alone will generally be all that is necessary. In prolapse of the second degree both operations may be necessary according to the severity of the symptoms; but in ptosis of the third degree both the kidney and the appendix should receive attention. On the other hand, if the appendicitis is of a mild type and the nephroptosis marked, generally, the mere fixing of the kidney to the lumbar wall will, by restoring the circulation in the appendix, cause the latter to resume its normal condition, or at least will result in a cessation of symptoms.

DISCUSSION.

Dr. Bacon Saunders, of Fort Worth, Texas.—While I appreciate the compliment of being called upon to discuss this very excellent paper, I also realize the fact that anything I may say will not add materially to the interest of the subject.

All of us, I think, especially since Edebohls has called special attention to this condition, have observed these two conditions together. In my own personal experience it has not been so common as to attract my attention so especially to it as indicated in the paper. Having had a number of cases in which I had both of these conditions to deal with, I have not had the experience that would lead me to believe that the conditions are so commonly combined as the paper would seem to indicate. I mean by that to say, that my own personal experience has not led me to believe that many of my cases of chronic appendicitis have depended upon movable kidney, although it is possible such may have been the case, and it may have been overlooked. Only in a few instances have I personally found the two conditions combined. This may be a peculiarity of chronic appendicitis, as it occurs on the prairies of Texas—that is, it may differ from what it does in Michigan, or, perhaps, the Texas man may be deficient in observing so keenly as the Michigan man. But certainly in quite a number of cases of chronic appendicitis, I have not had occasion to think that movable kidney acted in any way in a causal relation in the great majority of cases.

Dr. Edwin Walker, of Evansville, Indiana.—I have noticed the co-existence of these two diseases, but I have not found them in a large proportion of cases. This last year I operated on a case where I at first anchored the kidney in its position, and removed the appendix and gall-bladder afterward. I have seen a number of cases of wandering kidney without appendicitis, and I think it is a question of doubt in many cases as to the causal relation of one to the other. I have seen quite a number of the latter class of cases, and it seems to me we should often find appendicitis with it, but it may be a coincidence rather than a cause.

Dr. Robert T. Morris, of New York City.—I would like to say a word or two on this subject. It comes down to a matter

of definition of appendicitis. What do we mean by appendicitis which occurs with movable kidney? Do we mean congestion of the appendix, or true infective appendicitis? Congestive appendicitis often occurs in these cases. Since the publication of Edebohls' paper, I have given attention to this subject, and I quite frequently find that where there is a loose kidney "pressing upon the superior mesenteric vein," we have associated with it a congested cæcum, and if we make a careful palpation, we find the appendix tense. Are we more apt to have infection in these cases in which there is congestion? Not according to my statistics. Infective appendicitis may be found in these cases, but they do not seem to be particularly prone to it.

Dr. Charles P. Noble, of Philadelphia.—The subject of movable kidney is one which has engaged my attention a good many years. I have operated on about one hundred cases of movable kidney.

As to the frequency of appendicitis in connection with movable kidney, so far as my observation goes, it is very unusual. Out of a hundred cases, there have not been more than half a dozen in which the appendix was involved. I recall several cases in which the appendix was removed, and several others in which there was catarrhal appendicitis. I have once or twice operated on movable kidney where some other surgeon has taken out the appendix. I should say 6 or 8 per cent. would cover the percentage of the interrelation of the two diseases.

Dr. A. M. Cartledge, of Louisville.—This subject is interesting. I do not think the essayist is exactly right in giving the percentage of cases in which he considers the two conditions are associated. It is often larger than the statistics he gives.

I have had occasion to investigate the subject a little, approaching it from a different standpoint to those who have operated on movable kidney. After operating on a number of cases of movable kidney and a number of cases of chronic appendicitis, and failing to relieve symptomatically my patients, it led me to seek the cause, and I think I find in this very condition two things that are associated. These women have severe pain in the right side. The gall-bladder, appendix, or kidney we cannot say much about, especially in these very slight irritations about the appendix. I will venture

the assertion, that if Dr. Noble will take his cases of movable kidney, with vague pain extending down usually in the right loin and right leg, which he attributes entirely to the uterus, and approaches them by operating on the appendix with a high incision, quite oblique, he will find that the appendix, as Dr. Morris has said, is not probably infected. The first thing he will see will be the cæcum covered over with a veil of thin adhesions, extending away up the cæcum. That is such a common picture that every man here, who is doing abdominal surgery, sees it nearly every week. There is movable kidney back of it; that is one of the symptoms that attends movable kidneys—a congested cæcum. There are some changes about the appendix. Obliterating appendix is quite common with movable kidney. If the kidney is directly movable, I find by extending the incision into the loin I can fix the kidney and attend to both conditions through the one incision. It can be done easily, and I think it is the best incision for fixation of the kidney. With a broad retractor, pulling the cæcum and colon to the central line, and another to retract the muscles, we have an excellent view to fix a floating or movable kidney through this incision.

Dr. Edebohls is right in supposing that these two conditions (appendicitis and movable kidney) frequently coexist. I do not agree with the essayist in regard to the causal relation between movable kidney and irritations about the appendix. His explanation of the condition does not impress me as being the most plausible. It is the lengthening frequently of the mesentery surrounding the kidney and the constant jamming of the cæcum from behind which produces pathological changes in the appendix. If in women who have these vague pains with movable kidney we make the incision higher than the usual appendix incision, relieve the congested cæcum close to the peritoneum, with good retractors, we will have a good view to fix the kidney at the same time that we remove the appendix, and we may be able to determine if gallstones are the cause, and these patients will not come back to us with right-sided pain and without relief symptomatically.

Dr. Alexander Hugh Ferguson, of Chicago.—I do not think there is any relationship between appendicitis and floating kidney. In the most extensive cases of floating kidney we meet with, we have no appendicitis whatever. The kidney may be down on the brim of the pelvis without disturbing the

appendix. The pain may be referred to the ureter toward the bladder, and not to the appendix.

In opening the abdomen for other conditions, and examining the appendix, you will find almost every one to be more or less diseased. I will venture to say, that if the appendix of every person in this room were removed just now, 95 per cent. of them would be found to have something the matter with it, if not macroscopically, you can find microscopically.

Last Thursday I had a case of floating kidney. I opened the abdomen and found adhesions between it and the gall-bladder. I removed the appendix, which had a cirrhotic tip, but the patient had never had pain around the appendix.

I am convinced that constipation lasting for years is a causative etiological factor in producing these two conditions —floating kidney and appendicitis; but to say that a floating kidney is one of the causes of appendicitis or *vice versa* I fail to corroborate.

Dr. S. P. Kramer, of Cincinnati.—Most surgeons of considerable experience will admit the occasional occurrence of appendicitis as being accompanied with floating kidney. If we will remember, in the vast majority of cases of floating kidney there is an accompanying enteroptosis or gastroptosis, with frequent attacks of constipation, sometimes diarrhœa, and this is a predisposing cause of appendicitis, the exciting cause, in all probability, being the erosive action of retained secretion of fecal matter.

Dr. C. H. Mayo, of Rochester, Minn.—I have been very much interested in the paper and the discussion. I do not think that we fix now more than one-half of the kidneys that we used to do. There is one class of floating kidney which is very movable, which you can fix and secure a good result. In these cases we are now removing the appendix at the time we anchor the kidney, in order to determine what relationship there is between the two.

There is another class of movable kidney in which there is some obscure connection, and in these we examine the gall-bladder and fix everything we can find, beside the kidney, in order to bring about relief. In the reports of those who have done so much of this work on the kidney and the appendix, it is most surprising when we come to classify them, to know what has been done. In half of them the operators have fixed the kidney and removed the appendix; in a great number of

them they have found gallstones, and they had malpositions of the uterus and ovarian troubles in others; they found so many different things which it was necessary to repair in order to relieve the conditions, and yet they classify their cases as movable kidney.

Dr. W. P. McAdory, of Birmingham, Alabama.—I have been very much impressed with this discussion. It would seem that Edebohls fixes everything that needs fixing, and classifies his cases anyway he desires. But I know from experience that he does fix a great many kidneys, and he does other things beside it. I cannot believe that movable kidney has much to do in causing chronic appendicitis; while the two may occur frequently together, yet I think if you remove the appendix or correct the other conditions which may exist, you will relieve the patient.

Dr. Manton (closing).—I am gratified that my paper has brought out such a free discussion. I was prompted to write this paper because I see so many cases sent to me with obscure symptoms, not referable to the kidney or to the appendix, and yet these symptoms are absolutely relieved when the appendix or the kidney, or both, are attended to. These are not cases of infective appendicitis; they are cases of chronic catarrhal appendicitis. I have had a good many of these appendices examined, and have never yet found one that was not more or less involved in its inner coats. I have seen some that were almost ulcerated through the peritoneum.

As Dr. Cartledge remarked with reference to adhesions, if we get a condition of that kind and remove the two conditions, or remove one condition, the patient is cured symptomatically. There are two conditions of movable kidney, one of which is acquired, and the other, floating kidney, is congenital. These two conditions are confounded almost invariably by speakers. I have had considerable experience during the practice of pelvic and abdominal surgery for the past twenty years, and have met with but two or three cases of floating kidney, while I have seen hundreds of cases of movable kidney. I have had an opportunity to fix a fair number of movable kidneys, but, as I remarked in my paper, in this series of cases there were only eleven where it was found necessary at the time to operate, so that it is not always necessary to do both operations on every case.

What Dr. Ferguson said in regard to pain in the ureter is

hardly relevant, because we may get kinking of the ureter, and presents definite symptoms, which is an entirely different thing. As I said at the beginning, the majority of my patients did not have pains or symptoms referable either to the appendix or to the kidney, but when the two conditions or one or the other was relieved the patient got well. A patient suffering from a chronic appendicitis, with the tip of the appendix adherent on the other side of the abdomen or elsewhere, or buried in a lot of adhesions, by removing the organ the patient is relieved of suffering and the local and remote symptoms disappear.

A NEW METHOD OF SUTURING THE FASCIA AND LEVATOR ANI MUSCLE IN PERINEORRHAPHY, ALSO AN OPERATION FOR COMPLETE LACERATION OF THE PERINEUM DESIGNED FOR THE PURPOSE OF ELIMINATING DANGER OF INFECTION FROM THE RECTUM.

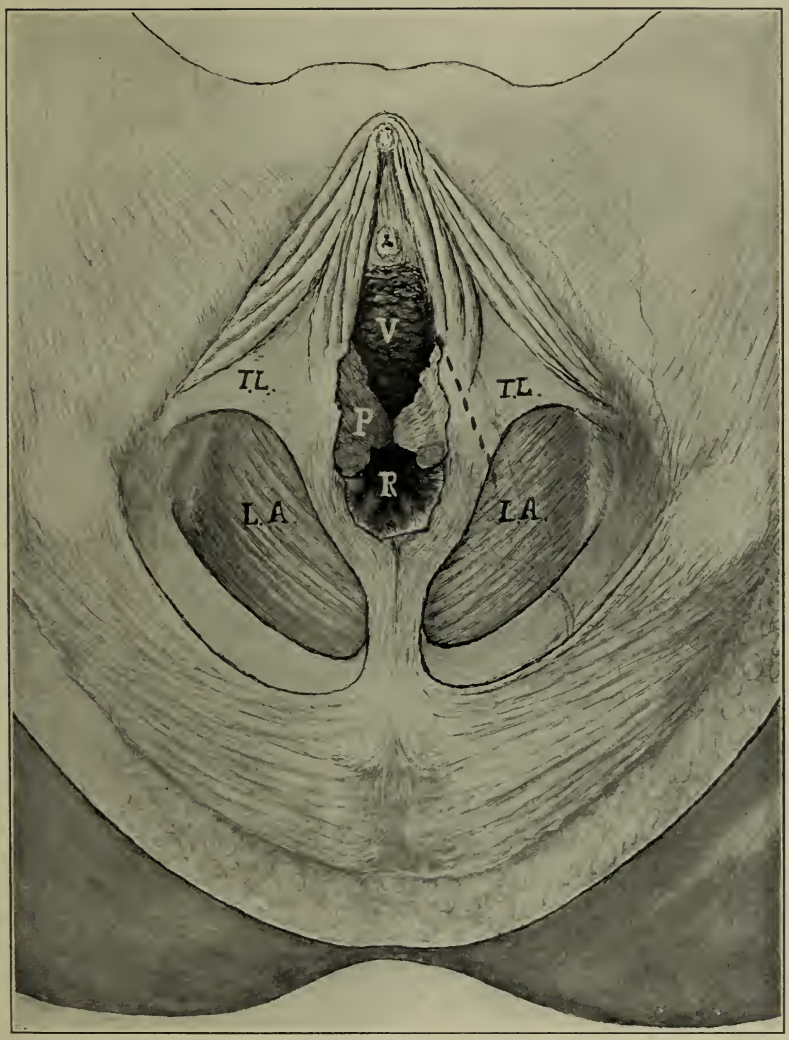
By George H. Noble, M.D.,
Atlanta, Ga.

AN OPERATION FOR INCOMPLETE LACERATION OF THE PERINEUM.

The fact that so many operations have been devised for laceration of the perineum proves that repair of such injuries has not been uniformly satisfactory. Surgeons of skill recognize that something is wanting and seek relief in modifications of their own. A few of them have called attention to the importance of suturing the fascia, more from theory than practice, I presume, for the methods proposed were not usually perfected; vague references to fascia rather than specific definitions appear in their writings, making it difficult to follow important steps in the technique of operations.

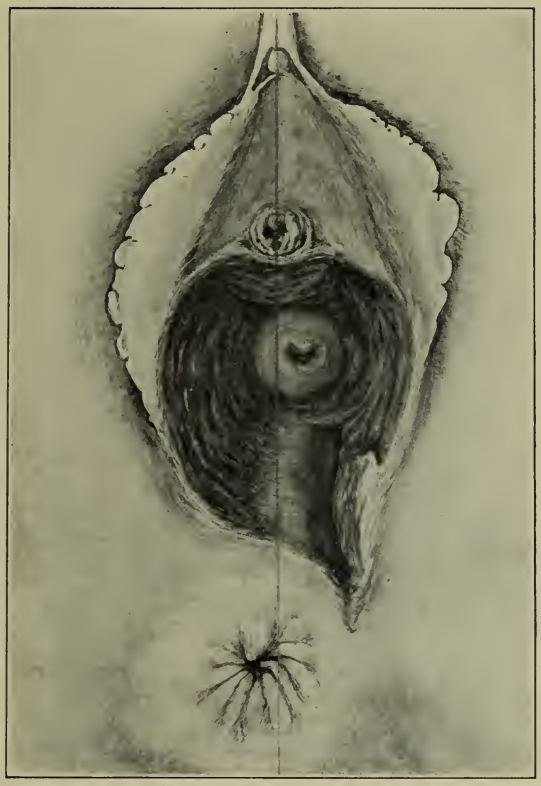
In travelling the same field I encountered some of the difficulties others have met with, and after an extended experience have been forced to the conclusion that most surgeons have failed to give the anatomy of the pelvic floor due consideration. The apparent simplicity has stripped it of interest, and yet tedious dissection is required to demonstrate its component parts. But, in a brief paper like this, it is not expedient to give a detailed account of

Fig 1.



In anterior lacerations (V. R.) the fascia does not retract beyond a slight extent, but in lateral tears extending around to the posterior verge of the anus the triangular ligament is torn through on one side in the direction of the dotted line V. to L. A., and is then free to retract in the direction of its bony attachments.

Fig. 2.



Representing lateral laceration, in which the triangular ligament is severed. The anus is displaced slightly to the opposite side.

the anatomical relation of the fascia and muscles, since many excellent illustrations have lately appeared in print, notably in Deaver's *Anatomy*. I will, therefore, refer the reader to such works for the study of anatomy most concerned in the operation of perineorrhaphy. The fasciæ to be especially noted are: first, the rectovesical, which line the concavity of the levator ani muscle, and, therefore, rests upon its superior surface; second, the deep pelvic fascia which covers the convex or inferior surface of the muscle and lies immediately adjacent to it; and, third, the triangular ligament, which embraces the layers of fascia external to the last mentioned, covering the pelvic outlet anterior to the anus. Through all of them the vagina and urethra pass. The rectum passes through the first two and is attached to the posterior border of the latter in the median line.

Some years ago when I first began to dissect the different layers of fascia and suture them in doing perineorrhaphy, I thought retraction of common occurrence, but, after devising a systematic method of dissection, found that retraction beyond a slight degree was the exception. In anterior laceration (complete and incomplete) it does not occur, for the attachment of the fascia to the rectum is not disturbed (Fig. 1), but in lateral lacerations extending posteriorly to the rear of the margin of the anus, the triangular ligament is torn through on one side and is free to retract in the direction of its bony attachments. In such cases the tear extends from the vagina (V, Fig. 1) in the direction of the dotted line (L. A., Fig. 1), producing the appearance depicted in Fig. 2, though the skin is not torn the full extent of the laceration.

Exceptions to this rule occur when the line of separation passes through the central tendon down to the sphincter ani, and then skirts around the muscle to the rear of the anus. In this instance the triangular ligament is not completely separated from the central tendon which holds it fast to the deep fascia, preventing retraction.

The deep pelvic and rectovesical fasciæ do not retract, as they are held more or less in position by their attachments to the pelvis, and especially to the levator ani muscle, consequently these two layers can always be found without difficulty.

If there are reasons to believe that the triangular ligament has been severed, its lower border should be palpated by introducing the index finger into the vagina and placing the thumb on the perineum to one side of the anus (Fig. 3); then, by rolling the tissue between them in the vertical direction, its presence or absence may be noted. If it cannot be felt insert a pair of tenaculum forceps in the side of the torn perineum opposite the anus, that is, in the part separated from it just above the external sphincter, and draw it toward the median line, with a view of putting the severed portion of the ligament upon the stretch, then palpate as above described, and its lower border may be felt between the fingers. It may be isolated or exposed by blunt dissection. While holding the parts taut with the hooked forceps, expose the bulbo-cavernosus by dissecting midway between the deep pelvic fascia and the cutaneous surface, where the principal layer of this ligament will be found in contact with the external side of the muscle; or if accurate knowledge of the relative positions of the several layers of the fascia is wanting, a blunt hook may be passed behind the lower border of the triangular ligament into the space between the latter and deep fascia at a point just external to the central perineal tendon by inserting it in the fatty tissue beneath the skin, with its point directed outward until buried about half an inch; next turn directly inward in the direction of the axis of the pelvic outlet until it reaches the deep fascia, where it will meet with a feeling of resistance; then turn by rotating the instrument upon the axis of its handle until the point is directed toward the median line. This will produce a little prominence on the side of the torn perineum posterior to the triangular ligament, where it has been separated from the conjoined ten-

Fig. 3.

Photograph. With the index finger in the vagina and thumb on the perineum by the side of the anus, the lower border of the triangular ligament may be felt by rolling the tissues between them.

Fig. 4.

Photograph of a dissection of the levator ani muscle, taken from Jewett's "Practice of Obstetrics."

Fig. 5.

Showing retraction of the decussating fibres when lacerated.

don of the perineum. From this point it can be traced up and down, as the case may require, and its edges accurately approximated with sutures.

The muscle most concerned in the operation is the levator ani. The fact that so many papers dealing with its functions and repair appear in current literature shows that the importance of the muscle is being impressed upon the surgeon, yet there are many who have failed to understand the principle upon which it acts as a support to the floor of the pelvis. It is more or less parabolic in shape and hangs antero-posteriorly in the pelvis like a loosely swinging hammock, except its sides are anchored to the lateral walls of the pelvis. (Fig. 4.)

The rectovaginal cleft in the centre line may be likened to an immense tear in the bottom of the hammock. Now imagine a person lying in such a swing. The tendency is for him to slip through the opening like a wedge forcing the sides apart; so it is with the muscle. It is more or less parabolic in shape and receives the intra-abdominal force in the reverse direction in which a parabolic reflector casts off rays of light. (Figs. 4, 5, and 6.) The intra-abdominal pressure strikes all parts of the muscle within its concavity and is deflected to the centre, showing a tendency to concentrate at a point which corresponds to the perineum. The latter forms a bond across the cleft holding the two sides of the muscle together, converting the opening into two small ones, rectal and vaginal. When this bond (perineum) is severed the sides of the levator ani muscle separate and resistance to superimposed weight diminishes. Acting upon the principle of a wedge, the pelvic contents in passing downward have a tendency to dilate the aperture and finally extrude.

The importance of the decussating fibres of the muscles passing across the perineum from side to side are underestimated. They not only assist in holding the two sides of the muscle together, but aid in closing the vaginal introitus and supporting the base of the bladder. When rup-

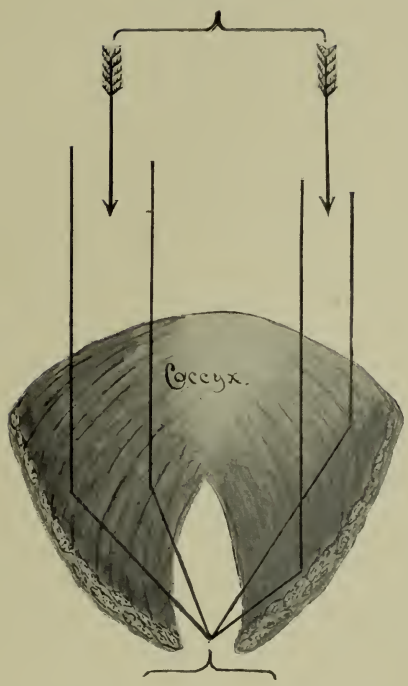
tured, these fibres retract to such an extent that their ends cannot be brought in contact (X, Fig. 5); therefore, union of this muscle, as commonly effected is nothing more than edge-to-edge contact in the direction of its fibres, which in ordinary circumstances must eventually separate. The transversus perinei muscles, the bulbo-cavernosus, etc., do not retract to a very great extent, and can be found in close relation to the protecting fascia. The latter muscles are small and contribute very little to the support of the floor of the pelvis, and, as their isolation and suturing are so unimportant, I have eliminated their consideration from the features of this operation as an unnecessary complication. I unite them *en masse* with the sutures that are used to sew the deep fascia and triangular ligaments.

I will first give in a brief way the technique of the operation as I have been doing it, and then follow with a description of my recent modification of incising and suturing the levator ani muscle:

1. The perineal denudation should extend from the skin to the upper border of the levator ani muscle and from the rectal angle to the point marking the posterior commissure. The latter can be recognized by existing scars. This makes an irregular quadrilateral surface on each side of the vagina; the anterior is shorter than the rectal border, as the cutaneous and vaginal lines converge slightly at their anterior extremities.

2. The next step is exposure of the levator ani muscle. This is done by inserting the thumb and finger in the vagina and grasping the muscle as it courses along the vaginal border of the denuded surface. (Fig. 7.) It is then seized with a pair of tenaculum forceps, drawn into the vaginal orifice, and the sheath of the muscle is opened by blunt dissection (Fig. 8) in the direction of the fibres of the muscle. After the sheath has been opened to the upper side of the forceps for about an inch or to the crown of the perineum, the handle of the forceps is turned upward and the dissection extended down to the rectum, deep penetra-

Fig. 6



The levator ani muscle, being more or less parabolic in shape, receives the intra-abdominal force in the reverse direction to that in which a parabolic reflector casts off rays of light. The intra-abdominal pressure strikes all parts of the muscle within its concavity, and is deflected to the centre, showing a tendency to concentrate at a point corresponding to the perineum.

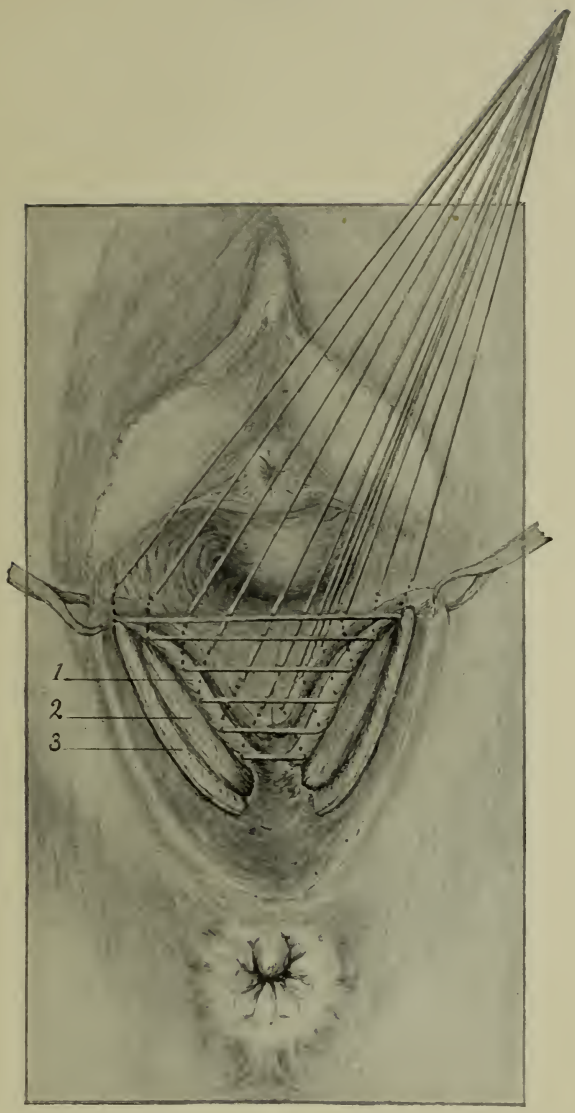
Fig. 7.

Photograph. The thumb and finger are inserted into the vagina and grasp the muscle as it courses along the vaginal border of the denuded surface.

Fig. 8.

The levator ani muscle is then seized with a pair of tenaculum forceps, turned into the vaginal orifice, and the sheath of the muscle opened by blunt dissection in the direction of the fibres of the muscle.

Fig. 9.



The vaginal margin is closed by inserting medium-size catgut sutures about three-eighths of an inch from the edge of the wound, penetrating first the vaginal mucous membrane and next the rectovesical fascia, issuing from the space formed by separating the latter and the levator ani muscle. They cross to the opposite side, pass between the levator ani muscle and the rectovesical fascia 3, 1, puncturing the latter about three-eighths of an inch from the edge, and emerge upon the vaginal surface.

tion and laceration of the muscle being carefully avoided. The second pair of tenaculum forceps is then inserted within the sheath of the muscle, taking firm hold of the muscular tissue, and separation of the fascia completed by the finger, exposing a strip of muscle about three-fourths of an inch wide. The forceps are then removed and the opposite muscle exposed in the same way.

3. The vaginal margin is closed by inserting medium-sized catgut sutures about three-eighths of an inch from the edge of the wound, penetrating first the vaginal mucous membrane, and next the rectovesical fascia, issuing from the space formed by separating the latter and the levator ani muscle. (Fig. 9.) They cross to the opposite side, pass between the levator muscle and the rectovesical fascia (3, 1, Fig. 9), puncturing the latter about three-eighths of an inch from the edge, and emerge upon the vaginal surface. The sutures, if interrupted, are tied as they are inserted, and repeated until the fascia (1, Fig. 9, also Fig. 10) is closed as far as the crown of the perineum. When using the continuous suture I frequently tie it at the posterior commissure and leave the end long, turning it aside temporarily to be used later for closing the margin of the skin.

4. The edges of the levator ani muscle are approximated in the median line by three kangaroo sutures, one just in front of the rectum, one just below the posterior commissure, and the third midway between these two. (Fig. 11.) They should transfix the muscles three-fourths of an inch back from the edge of each and embrace a large amount of tissue to prevent splitting of muscle. When tied the muscles are brought in close contact in the median line. (Fig. 12.)

5. Four kangaroo sutures are passed around the bulbo-cavernosus and the conjoined tendon formed by the triangular ligament and deep fascia. They should be inserted about midway between the cutaneous surface and deep fascia, penetrating the perineum deeply, and emerge be-

tween the deep fascia and the levator ani muscle, about half an inch from the edge of the former. They are returned upon the opposite side of the perineum in reverse order, and emerge external to the bulbo-cavernosus at a place corresponding to the starting point. (Fig. 13.) The lower stitch should be placed close to the rectum and the highest about three-eighths of an inch below the posterior commissure, and the remaining space divided by the other two. The second stitch in front of the rectum should pass through a small portion of the levator ani muscle to prevent formation of air space. When the sutures are tied the part embraced in their grasp comes in close contact and the edges of the deep fascia and the triangular ligament are brought into accurate apposition.

The last step in the operation consists in closing the skin and superficial fascia with interrupted sutures or by continuing down to the angle near the anus the whipstitch of catgut left hanging at the crown of the perineum. (Fig. 14.)

I have been doing the operation as above detailed for the past eight years with general satisfaction; but not being sure that the levator ani muscle would stand the strain put upon it, and fearing that it would separate and leave a thin place in the central portion of the perineum, I have recently put into effect an idea that occurred to me a few years ago concerning the importance of the decussating fibres of the muscle and conjoined tendon. It was my desire to reproduce these as far as possible, and in this way to imitate nature in the repair of injured parts. After finding an easy method of locating the most important layers of fascia and learning to dissect them from adjacent tissues, my mind naturally reverted to the feasibility of forming this useful bond of muscle around the posterior commissure of the vaginal orifice, securing end-to-end contact of the fibres and producing a union that would not separate under the strain to which the perineum is subjected.

The technique is as follows: The edge of the levator ani muscle on the right side is drawn into the open wound by

Fig. 10.

The sutures, if interrupted, are tied as they are inserted and repeated until the fascia (1) is closed as far as the crown of the perineum.

Fig. 11.

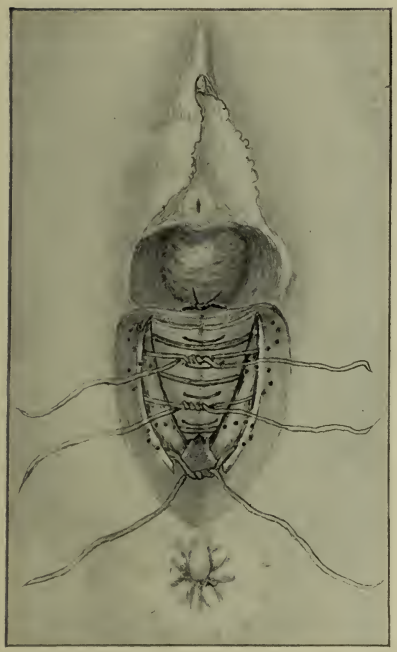


Fig. 12.

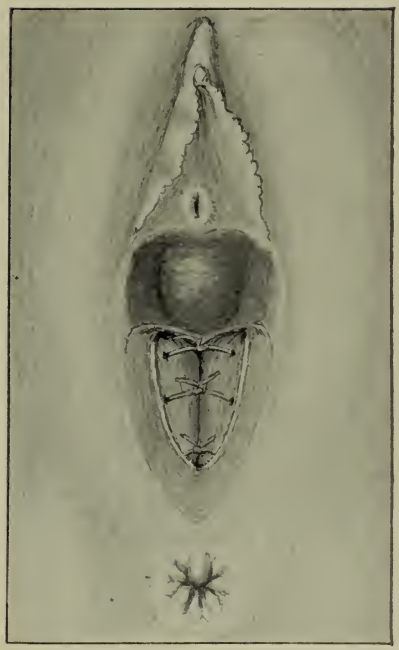


Fig. 11.—The edges of the levator ani muscle are approximated in the median line by three kangaroo sutures.

Fig. 12.—When tied, the muscles are brought in close contact in the median line.

Fig. 13.

Fig. 14.

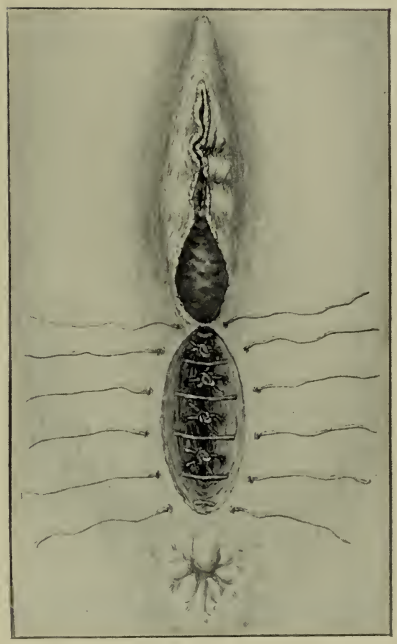
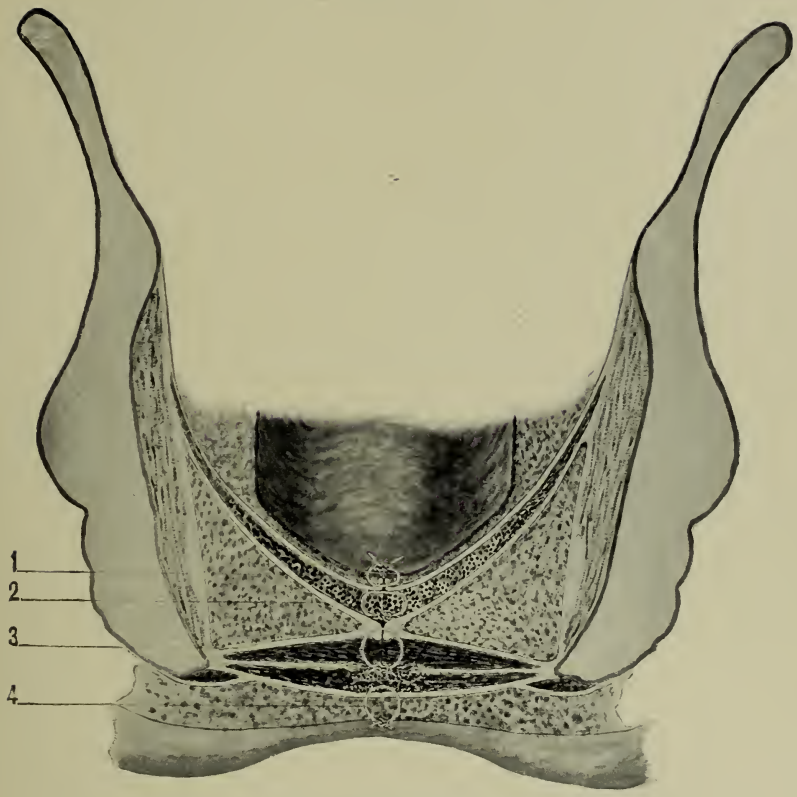


Fig. 13.—Four kangaroo sutures are passed around the bulbo-cavernosus and the conjoined tendon formed by the triangular ligaments and deep fascia. They should be inserted about midway between the cutaneous surface and deep fascia, penetrating the perineum deeply, and emerge between the deep fascia and the levator ani muscle about half an inch from the edge of the former. They are returned upon the opposite side of the perineum in reverse order, and emerge external to the bulbo-cavernosus at a place corresponding to the starting point.

Fig. 14.—The last step in the operation consists in closing the skin and superficial fascia with interrupted sutures or by continuing down to the angle near the anus the whipstitch of catgut left hanging at the crown of the perineum.

Fig. 15.



No. 1 represents a suture approximating the vaginal mucous membrane and the rectovesical fascia. No 2 represents a suture approximating the levator ani muscle. No. 3 represents a suture approximating deep pelvic fascia, triangular ligament, deep transverse perineal muscle, bulbo-cavernosus, etc. No. 4 represents a suture approximating the skin and superficial fascia.

means of tenaculum forceps and a kangaroo tendon passed through it at a point about three-fourths of an inch back from its border and low down by the side of the rectum; the kangaroo is carried across the median line to the border of the muscle on the opposite side and passed through it in the reverse direction. On tying it the edges of the muscle approximate snugly immediately in front of the rectum. Just in front of this suture an incision three-fourths of an inch in length is made in the puborectal part of the muscle inclining downward and outward at an angle of about 45° to the horizon. (Fig. 16.) This cuts the muscle nearly perpendicular to the course of its fibres. The opposite border of the muscle is treated in the same way. The severed ends are turned across the perineum behind the posterior commissure (Figs. 17 and 18) and united in the median line by one kangaroo suture inserted three-fourths of an inch back and tied tight enough to keep the ends of the muscles together without pressure. Below this point a triangular pocket is formed which is effaced by passing a kangaroo suture from side to side through the pubococcygeal portion embracing three-fourths of an inch of the muscle. (Fig. 17.) When this suture is drawn tight it forces the two sides together, completely filling the pocket and adding firmness to the muscular support of the floor of the pelvis. (Fig. 18.)

I am glad to say that the eight cases treated in this way show most excellent results and promise to be lasting in effect.

I have not given minute directions for denuding the perineal surface, because the conditions vary so much in different cases that it is next to impossible to express in writing a clear idea of the requirements that are to be met. The chief points to be observed are not to pare off the skin of the vulva or to extend the denudation forward beyond the posterior commissure, but to remove scar tissue and mucous membrane far enough within the vagina to gain easy access to the edge of the levator ani muscle. Irregular

lacerations involving the vagina and distortions caused by scar tissue must govern modifications of the above, when present, and in closing them each case must be a law unto itself. Further than this, injuries of the vagina will not be noticed, as the object of this paper is to present an operation the main feature of which pertains to the perineum proper.

I am sure a decided advancement has been made in the operation by changing the method of suturing the edges of the levator ani muscle to the plan of incising and stitching together in the median line the cut ends of the puborectal portion. It forms a strong loop of muscle around the vaginal orifice, giving the perineum better support, and makes a connecting link between the two sides of the muscle, preventing its tendency to separate. It draws the perineum forward, closing the vaginal orifice effectively, and prevents the inclination of the bladder and urethra to turn outward.

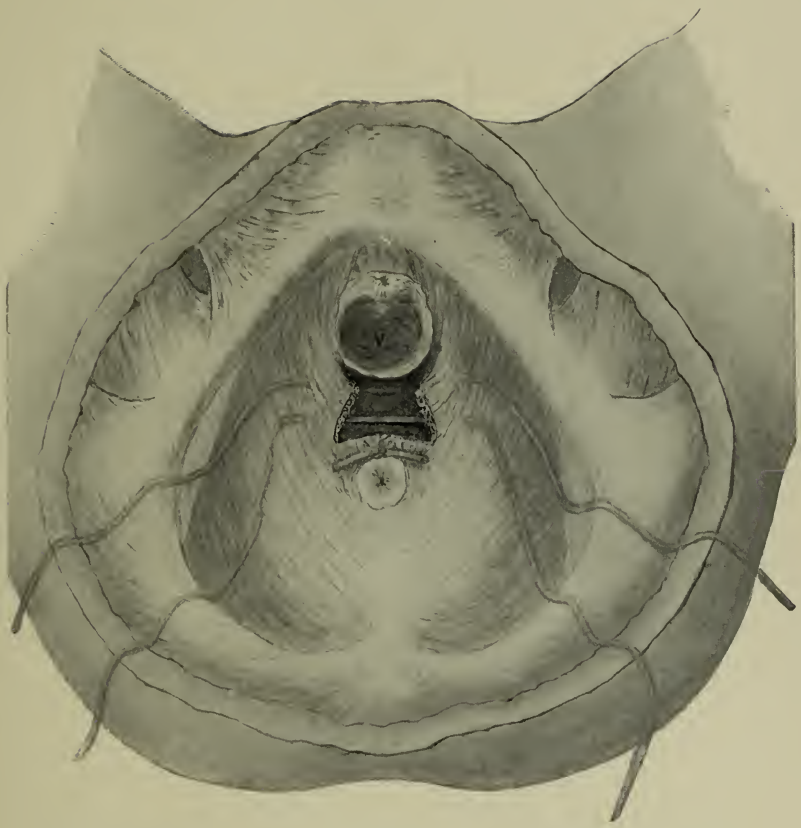
The execution of this step in the operation is simple and is devoid of hemorrhage. It does not increase the pain unless the sutures are tied too tight through carelessness.

Formerly I dissected the deep pelvic fascia from the deep transverse perineal muscle and sewed it with a separate row of sutures, also exposed and united the bulbo-cavernosus with an additional row of sutures; but it is not necessary and requires too many buried stitches. It would frequently show the fascia (Fig. 19) and muscle beautifully, but requires considerable experience to make quick and satisfactory dissection. For this reason I have changed the method of dealing with these parts to the description above; that is, to embrace the deep fascia and bulbo-cavernosus in the same sutures. If it is desirable to get direct union of the ends of the latter muscle it can be done by exposing it in the same way we do the levator ani muscle; the place of dissection lies midway between the skin margin and deep fascia. The method of suturing need not be changed; however, I do not recommend this step as an important feature.

Fig. 16.

Just in front of the suture an incision three-fourths of an inch in length is made in the puborectal part of the muscle, inclining downward and outward at an angle of about forty-five degrees to the horizon.

Fig. 17.

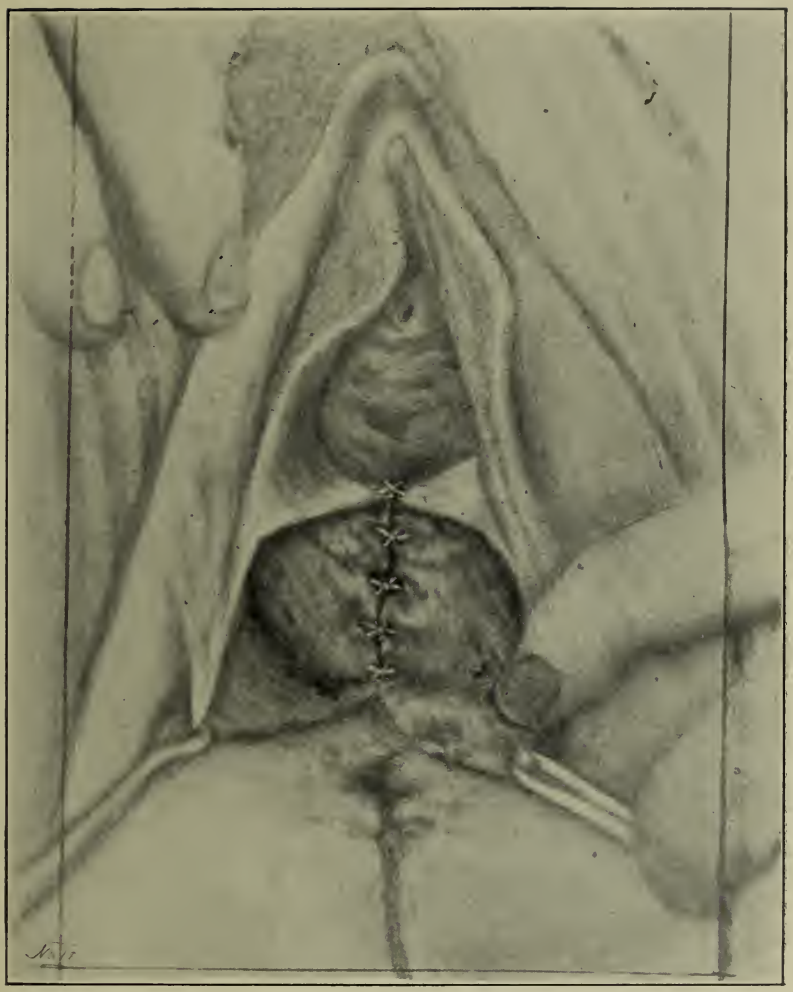


Showing position of kangaroo sutures used to approximate the ends of the muscle.

Fig. 18.

The cut ends (M) of the muscle are turned across the perineum and united in the median line, reproducing the decussating fibres.

Fig. 19.



Photograph of the deep pelvic fascia united by buried sutures.

In the time that I have been doing this operation many cases have been closely watched, and I am glad to say that it has stood the test of childbirth effectively, and I feel justified in making the statement that the results, both immediate and remote, are far superior to other methods I have tried.

The advantages are:

1. Greater strength, contributed by union of fascia.
2. Better approximation of the muscles on either side by forming a band across the rectovesical cleft, converting it into two openings, rectal and vaginal, in place of one.
3. The muscles do not separate and leave a thin perineum as in the case of lateral union of the muscular edges.
4. It contracts the vagina, draws the perineum forward, and effects better closure of the introitus.
5. It gives better support to the base of the bladder.
6. It draws the posterior wall of the vagina forward in front of the cervix uteri, thus having a tendency to prevent forward slipping of that part of the uterus, and diminishes slightly one of the contributing factors of retroversion.

OPERATION FOR COMPLETE LACERATION OF THE PERINEUM.

My new operation for complete laceration of the perineum consists in splitting the rectovaginal septum, dissecting the lower end of the rectum from the vagina and drawing the anterior rectal wall down through and external to the anus, converting a complete tear of the perineum into an incomplete laceration. The line of incision (black line, Fig. 20) starts on the external side of the sphincter dimple at a point close to one end of the sphincter muscle (S. M., Fig. 20), care being taken not to cut the skin at this point. It follows the edge of the sheath of the muscle, passing between it and the rectal mucosa, making the flap at this point as thick as possible. It then turns upward and forward to the cellular interspace of the rectovaginal septum (S., Fig. 20), splitting it in the centre, and returns on the

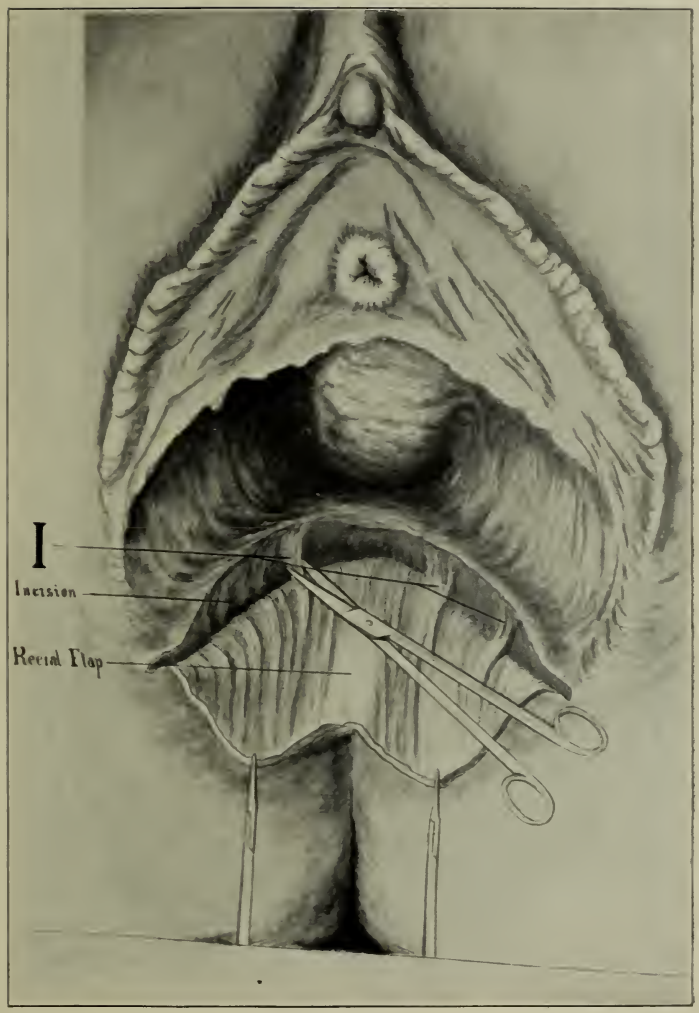
opposite side to a place corresponding to the starting point. This makes an incision similar to the ordinary flap-splitting operation, except at its extremities. The incision is best made with a pair of sharp-pointed scissors. After cutting through the cicatricial structure to the healthy tissue beneath, two pair of light compression forceps are placed on the rectal flap some distance to either side of the centre, embracing in their grasp the entire thickness of the rectal wall. The left hand should be protected with a rubber glove and the index finger passed into the rectum beyond the angle of the laceration as a guide to prevent perforation of the rectal flap. The forceps are held with the remaining fingers of the left hand, and as slight traction is made upon them, ridges or bands of tissue form across the line of incision (I, Fig. 21); these are cut as they appear. The point of the scissors should be turned slightly in the direction of the vagina; that is, away from the rectum, to avoid liability of perforating the latter. Unless care is observed the tendency will be to cut the flap too thin, so as not to embrace the entire thickness of the rectum; this can be avoided by confining the incision to the cellular interspace.

After reaching this stage of the operation there is no longer any necessity for the finger in the rectum. It should be withdrawn, the glove removed, and the hands resterilized. The torn surfaces of the perineum are next denuded and the excess of the vaginal flap cut away. Two kangaroo sutures (Fig. 22 and I, II, Fig. 23) are inserted deeply into the perineum behind one end of the sphincter muscle, pass to the opposite side, taking up in crossing the thickest part of the rectal flap (about its middle portion) without penetration of the rectal mucosa, and return to the other end of the sphincter ani to issue at a point corresponding to the place of introduction (Emmet sutures). In exceptional cases the sphincter muscle may be very much shortened or retracted and its ends require approximation by buried sutures to secure the best immediate results. When the Emmet sutures are tied the wound is converted into

Fig. 20.

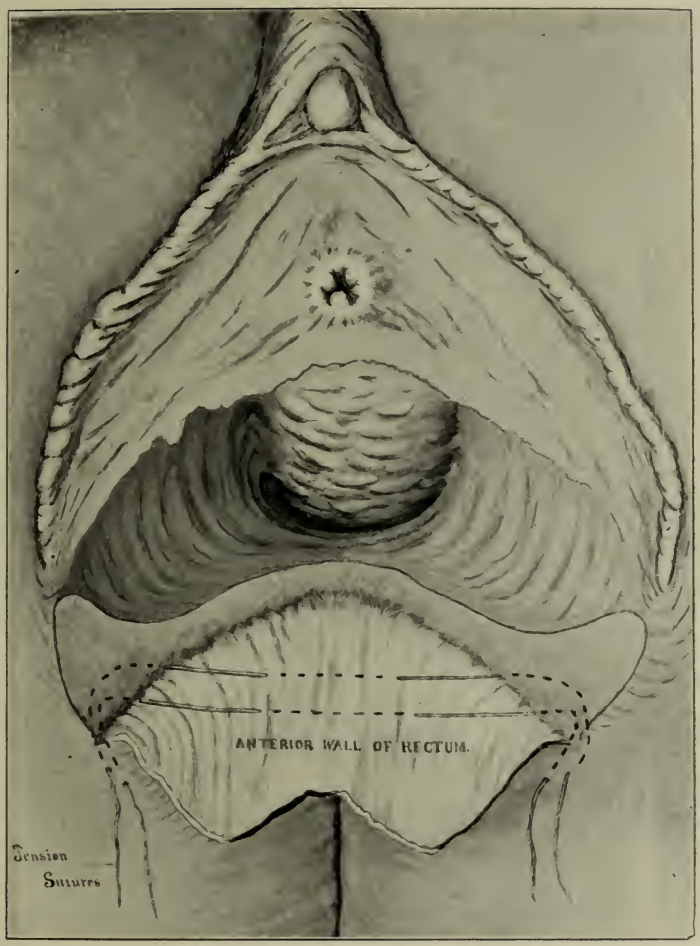
The line of incision (black line) starts on the external side of the sphincter dimple at a point close to one end of the sphincter muscle, S.m. It follows the edge of the sheath of the muscle, passing between it and the rectal mucosa, then turns upward and forward to the cellular interspace of the rectovaginal septum, S, splitting it in the centre, and returns on the opposite side to a place corresponding to the starting point.

Fig. 21.



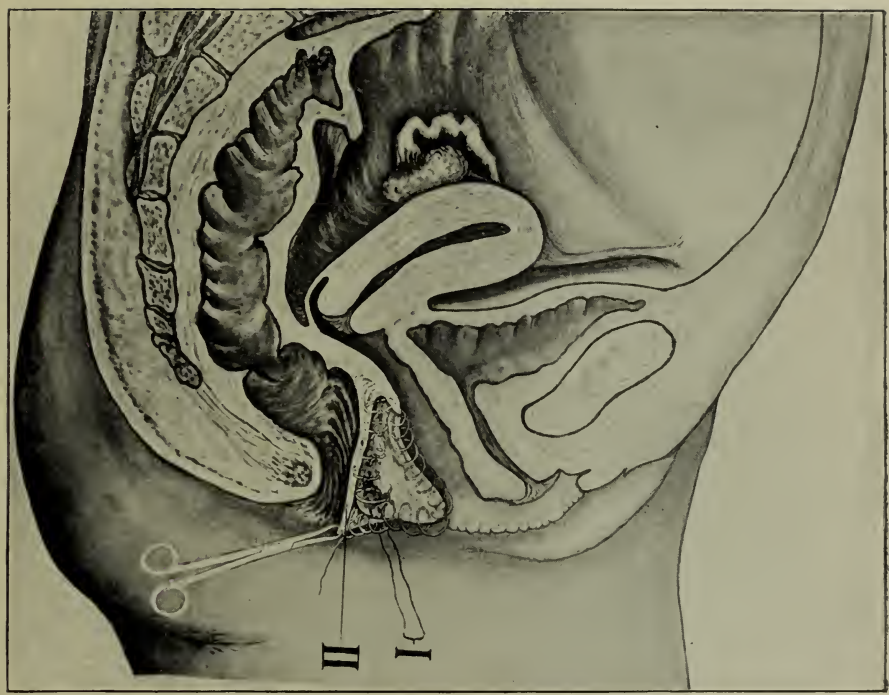
When slight traction is made upon the rectal flap, ridges or bands of tissue will form across the line of incision; these are cut as they appear (I).

Fig. 22.



Two kangaroo sutures (tension sutures, Fig. 22, and I and II, Fig. 23) are inserted deeply into the perineum behind one end of the sphincter muscle, pass to the opposite side, taking up in crossing the thickest part of the rectal flap, about its middle portion, without penetration of the rectal mucosa, and return to the other end of the sphincter ani, to issue at a point corresponding to the place of introduction

Fig. 23.



Vertical section of Fig. 22, showing tension sutures, I, rectal flap, II, and whip-stitch sutures closing mucous membrane and skin. This illustration represents closure with buried sutures.

the condition of a simple perineorrhaphy (I, II, Fig. 23), and is then completed by some method employed for incomplete tear.

I like, however, to closely approximate the edges of the vaginal mucous membrane and skin with small catgut whipstitches, continuing the same down to the mucous flap (Fig. 24) projecting from the rectum. The edges of this flap are trimmed free of scar tissue, folded together, and closed with the same suture. The flap thus closed should be turned forward and anchored over the perineal incision (Fig. 25) with mattress sutures of kangaroo to carry it as far away from the anus as possible, with a view of lessening the risk of infection by contact with fecal matter. The kangaroo sutures absorb readily, the rectal flap retracts within the anus, and returns to its normal position in seven or eight days.

The advantages are:

1. The removal of liability of infection from the rectum and percolation of fecal matter in the wound.

2. The avoidance of rectal stitches with the pain, distress, ulceration, and cicatrization incident to such sutures.

3. It has an advantage over the Ristine operation on this fact that it is applicable to all cases, does not distort or disfigure the vagina, or turn a lot of cicatricial tissue into the rectum, and is devoid of all tediousness of dissecting flaps.

4. It promises uniform success and permits early evacuation of the bowels without jeopardizing results.

5. It is practically bloodless.

6. It is so easy to perform.

Those persons who have seen this operation admit its necessity, advantages, and say it is practical. They offer no objections, but I have been asked if dragging down the rectum displaces the uterus. To this I reply in the negative. It produces an excess of vaginal flap that requires trimming away; but the uterus is not disturbed in its normal relation to the pelvis, showing that no dragging upon it takes place.

The operation is very easily and quickly done. Making the flap and introducing the tension sutures require much less time than suturing the mucous membrane of the rectum in the present method of operating. Closure of the remainder of the wound is the same, and, therefore, is unchanged in either time or detail.

A notable feature is the small amount of bleeding that occurs. Really it is less than the average operation for partial laceration of the perineum. The reason is that in the latter hemorrhoidal vessels are encountered that cause more or less annoyance from venous bleeding. In this operation they are not encountered unless the mistake is made of cutting too close to the wall of the rectum, but if the incision is confined to the loose tissue between the rectum and vagina, the hemorrhoidal vessel will escape untouched and unnecessary bleeding will be avoided. In two instances I had to ligate a single vessel (they were in the first two cases) before I fully appreciated the importance of keeping in the cellular interspace.

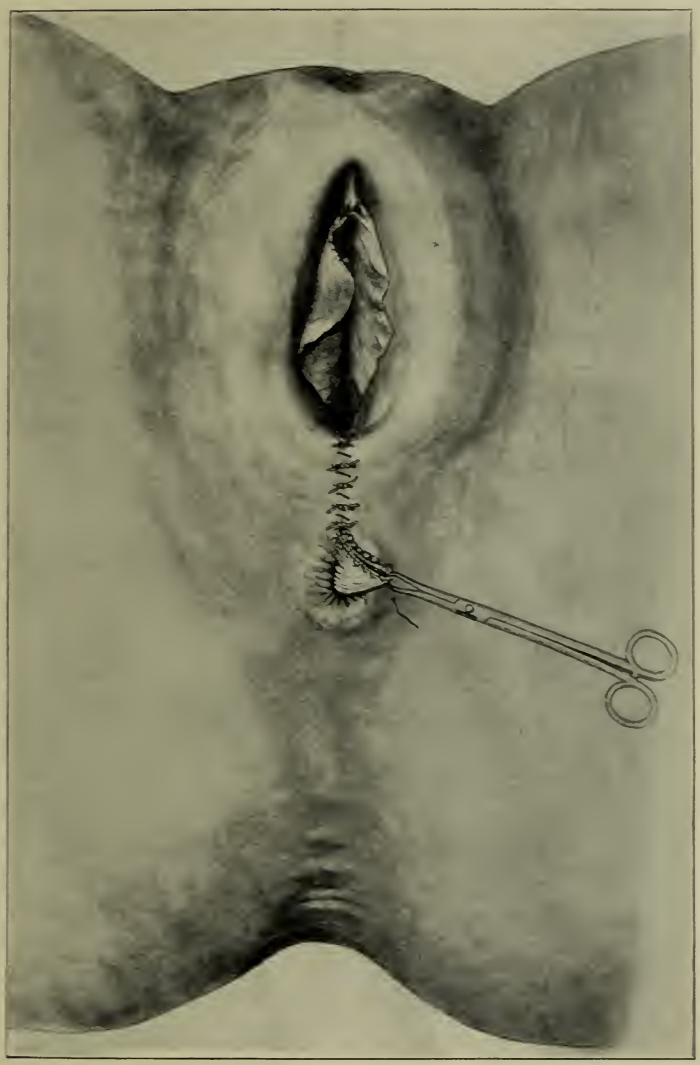
The bowels should be evacuated on the third or fourth day, using an oil and glycerin enema in addition to a saline purgative. The tension sutures are left to absorb, but should be removed if they become infected, usually about the seventh day.

This operation was presented to the American Gynecological Society in a hurriedly written paper in May, 1902. Since then I have done four additional cases and closed the rectovaginal fistulæ in two subjects by this method, making in all eleven cases since October 14, 1901, with perfect success in each one.

I renew the claims I made for it in my former paper and also recommend it as an operation for rectovaginal fistula in the lower half of the vagina; but I cannot say if it is suitable for fistula in the upper half, for the anterior rectal wall may not prolapse enough to bring the fistulous opening in it below the verge of the anus.

For rectovaginal fistulæ in the lower half of the vagina,

Fig. 24.



Whipstitch closing skin is used to fold together the edges of the rectal flap.

Fig. 25.

The protruding rectal flap is anchored on to the perineal incision to keep it as far from the anus as possible.

my operation is not a formidable one and does not sacrifice any part of the rectum, as the everted parts retract to their normal place just as they do in perineorrhaphy; consequently continence is not disturbed.

DISCUSSION.

Dr. Charles P. Noble, of Philadelphia.—This is a subject that cannot fail to be of interest to us, as we are constantly dealing with this condition. So far as the theoretical basis of this operation is concerned, I am entirely in accord with the essayist and have always had the same principles in mind in operating on the perineum. I do not operate as the essayist does, although I believe I accomplish much the same results. The considerations which he has laid down, it seems to me, are entirely sound, and what we should aim at in repairing every torn perineum is to do what he has demonstrated so beautifully with these illustrations.

As to whether this method is an improvement on the older methods, of course, the only way to know that is by the results secured. As to what we can do by the methods heretofore in use, we can get 98 or 99 per cent. of successes with the Emmet method, with some slight changes in technique, these changes being in the direction of securing a more firm outlet. In other words, we can, without this elaborate dissection, get almost perfect results, so that while I am not at all in the attitude of feeling that this operation Dr. Noble has brought forward may not be an improvement on what we have had, yet what we have now is very satisfactory indeed.

A method which I have used personally is based on the Emmet operation, which I learned of Kelly and Emmet, and which I practised for many years with comparatively satisfactory results. It seems to me, however, that there was one point in the technique laid down which was defective, and that was drawing down the central tip into the vulva, which had the effect, in my hands, at least, of keeping apart the lateral structures which one wants to unite; therefore, that was why we had a relatively patulous instead of a normal introitus, and for that reason I abandoned that method; and the modification which I have made in following out the operation is that I do not draw the central tip down to the plane of the hymen

the central tip is stitched *in situ* from a third to half an inch inside the hymen, depending on the degree of laceration. We have then the lateral structures to bring together in the median line, as in the Hegar operation. In 1897 I wrote a paper on this subject, with illustrations. One cut illustrates the splitting down of the levator muscles as shown by Dr. Noble. I found, as a matter of fact, that it was quite easy to overdo the operation by this method. In other words, with this splitting the doctor has recommended, it was quite possible to get a stricture of the vagina, so that now it is only in the most extreme cases that I do any splitting. I simply suture the fascia over the levator muscles, and suture the anterior borders of the levator muscles with the fascia over it, together in the median line. That gives all the lateral union which is necessary. I have done the operation long enough to be satisfied that we can get 98 per cent. of perfect results.

Dr. Noble (closing).—The reason I did not say anything in reference to bulging of the rectum or central tip of mucous membrane was owing to the time at my disposal and that this paper deals with the perineum proper. The fault mentioned by Dr. Noble is a common one, and I think each of us has recognized it in Dr. Emmet's work. Here is a sketch (indicating) which, while it is not absolutely correct, will serve to illustrate the original Emmet operation, representing a groove on either side and the bulging of the rectum in between. Emmet closed the sulci on either side and drew the rectocele down to the crown of the perineum. But, instead of doing that, it has been my habit to carry the denudation farther up on the posterior wall of the vagina, then push the rectum backward, close the vagina and fascia of the perineum in front of the rectocele in the median line.

In reference to elaborate dissection, I think Dr. Noble has the wrong impression. The only dissection necessary to do this work is simply two strokes with compression forceps, one up and the other down, taking care not to lacerate the muscle. The dissection is not elaborate at all. When the sheath is opened the muscle can be stitched together, or the puborectal portion can be turned around the posterior commissure as a substitute for the decussating fibres. There is no danger of constricting the vagina, because the change in the position of the muscle is confined to the perineum. It is the most satisfactory operation for perineorrhaphy that I know.

PREGNANCY AND LABOR FOLLOWING COMPLETE NEPHRO-URETERECTOMY.

By J. Wesley Bovée, M.D.,
Washington, D. C.

Removal of the kidney has become a frequent operation and no longer excites surprise or comment on the part of the medical profession. Removal of the ureter and kidney is done much more infrequently, although its effect upon the after-health of the individual is the same, save the additional traumatism incident to the operation and the longer incision which renders greater liability to post-operative hernia. It is well understood that removal of a kidney, the function of which has not been previously suspended, entails additional eliminative work upon the kidney of the other side. If the remaining kidney has been doing the work of both kidneys for a considerable time previous to operation then removal of the functionless organ has no special effect upon the work of its fellow. Absence of a kidney is met with once in about three thousand cases according to Morris, and other statistics show its absence has been noted in 2½ per cent. of cases. In De Jong's collection of 197 cases of nephrectomy with 81 deaths, in nine of the autopsies the opposite kidney was found atrophied or useless. It must be admitted, however, that one kidney is rarely able to perform the functions of two healthy ones and that any extra taxation upon its eliminative powers incident to auto-intoxication of various forms is liable to seriously embarrass its functional activity. When nephrectomy has been done for renal calculi with pyonephrosis or

tuberculosis the same condition is liable to be present, in some slight degree at least, in the remaining kidney. Its function is accordingly interfered with. The effects of pregnancy upon the kidney need not be dwelt upon, but a few words upon the subject will not be out of place at this time. Various investigators have found a marked toxicity of the urine during pregnancy. Nephritis during this condition is very common. Winckel claimed 2 per cent. of women that are healthy before pregnancy have albumin in the urine during pregnancy, and further that 6 per cent. of all pregnant women have albuminuria. Gaucher says the nephritis of pregnancy is of an autotoxic nature and consequently epithelial at first. If the cause persists, either prolonged intoxication or repeated invasion from successive pregnancies, the lesion becomes interstitial and assumes the anatomico-clinical characteristics of chronic mixed nephritis, predominantly interstitial. Whatever the nature of the poison, whether mineral, vegetable, or animal, all varieties of toxic nephritis have the same evolution. One notable fact in connection with the toxæmias of pregnancy, or urinæmia, is that the amount of urea in the urine is always found markedly diminished. Another important matter in conjunction with pregnancy and labor is the changes in arterial tension, which has been found to be normal during the first eight months, diminished during the ninth, and undergoing various changes during and following labor, as will be later mentioned. It is generally understood, however, that the changes going on in the economy of the woman in pregnancy call for greater demands on the heart, liver, and kidneys, and any interference with the action of one or more of these organs results disastrously to the others. As elimination during pregnancy is increased, naturally the arterial tension would be expected to be correspondingly increased. During labor it rapidly rises, reaching its highest degree at the moment of the birth of the child and reaching its minimum at the time of expulsion of the placenta. It then rapidly increases to above normal, remains

so for four or five days and then returns to normal. Marked increase of arterial tension has been frequently observed in eclampsia and albuminuria. A kidney obliged to perform all the renal eliminatory work of the body, which is naturally increased during pregnancy and labor, is working under great strain. If it be crippled by traces of the condition which required removal of its fellow, this strain or taxation is of greater moment.

It seems strange that with the hundreds of cases of nephrectomy that so few cases of pregnancy and labor following this operation are recorded in medical literature. After a careful search for reports of such cases in the Library of the Surgeon-General's Office of the U. S. Army, I have been able to find but two cases, and because of their rarity I will give them briefly.

Case I.—Steinheil (*Deutsche medicinischen Wochenschrift* (Leipzic), 1901, xxvii., 821) reports a case which came in his care in June, 1895, which was of a woman, twenty-five years of age, whose left kidney was removed for tuberculosis by Professor König seven years before and described by König in the same journal in 1900. She was two months pregnant and had a large amount of pus and a slight amount of blood in the urine. These urinary conditions improved and the patient was delivered of a healthy boy at full term with the slight assistance of forceps, February 4, 1896. She had a slight rise of temperature a few days after delivery, but the further course was normal with the exception of intractable retention of urine which required finally a retention catheter for a few weeks. The pulse varied from 100 to 120, and the condition of the urine was very variable. She was discharged from the hospital toward the end of March, nearly two months after delivery, and left the city. Communication was kept up until the patient died, November 25, 1897, the tubercular process having apparently become rekindled in the fall of 1897. The patient had passed more than one year and nine months after the delivery in a fair state of body and mind.

Case II.—Justice Schramm, of Dresden, in *Berliner klinischen Wochenschrift*, 1896, xxx., 113, in an interesting paper on "Pregnancy, Parturition, and the Puerperal Period after Extirpation of the Kidney," relates the following case: On April 1, 1891, he removed the right kidney of a woman twenty-five years of age for hydronephrosis. On May 6th the patient was discharged, having in the meantime experienced fever, retention of urine, with abundant pus and arrhythmia. The left kidney had been found to be entirely normal. For six months she was employed as a kitchen maid at heavy work and various other pursuits. At the end of that time she complained of a stitching pain in the region of the left k dney and hypertrophy of the left ventricle with arrhythmia. She married in November, 1894, and appeared before him in April, 1895, in her fith month of pregnancy, complaining of a tight feeling in the womb. The urine was abundant with only a slight amount of pus. The child, a six-pound female, was born after seven hours' labor, July 31, 1895. Except for the cardiac condition her childbed was normal. A persistent and extreme arrhythmia was present. The pyuria was slight and finally disappeared. The mother left her bed on the ninth day. Her recuperation was slow and tedious, to which the nursing of the child contributed not a little.

He refers to a case of Fritch's in which nephrectomy for ureteral fistula was done in 1892, and in which the patient had later conceived and retained excellent health. These are the only cases I find reported of pregnancy and labor following nephrectomy. Of interest in this connection is a case mentioned by Israel in his *Erfahrungen über Nierenchirurgie*, Berlin, 1894, p. 91, operated on by him July 8, 1893, in which he removed a tubercular kidney, and on the 27th of the following November she was delivered of a healthy child at full term. Nothing further is mentioned regarding the case.

My own case of complete nephro-ureterectomy stands alone, though not varying from the two mentioned from a

practical standpoint. The report of the nephro-ureterectomy was reported to this Society at its last meeting. The operation was done March 18, 1901, for pyonephrosis, renal calculi, and miliary abscesses in the ureter. Her last menstruation was July 23, 1901. There was no marked symptom of pregnancy or very little gastric disturbance or nervous phenomena. Nothing of moment occurred during pregnancy except the gradual enlargement of the abdomen and the production of a hernia at the site of the former incision. April 15, 1902, after a normal labor of six hours, she was delivered of a male child weighing ten and one-half pounds. On the third day after delivery she complained of intense pain diffused over the abdomen, and on the following day becoming localized along the course of the left ureter. There was tenderness for several days after cessation of the pain in this region. The urine was carefully watched for calculi but none were found. With the pain mentioned the temperature rose to 102° F. and continued from 100° to 102° for nearly a week, when it gradually declined to normal. Urinalyses made during the pregnancy showed nothing abnormal except the presence of albumin. An examination of a catheterized specimen in July, 1902, showed as follows: specific gravity 1022, albumin in large quantity, normal amount of solids and urea excreted, and no casts. Since the birth of her child she has breast-nursed it and has remained in splendid health. October 27, 1900, a urinalysis revealed no abnormal urinary condition except an abundance of albumin.

A question of vital importance in these cases is a permanent effect of pregnancy and labor upon the remaining kidney. In the case of Steinheil the patient succumbed to the extension of the tubercular process to the remaining kidney. Whether pregnancy and labor caused this extension in part or entirely cannot be determined. Certainly the woman had not suffered from renal trouble during the seven years following nephrectomy, but died one year and nine months after delivery. In Schramm's case no history

of the patient subsequent to her discharge from the hospital is given. In my own case the condition of the remaining kidney does not seem to be worse than before pregnancy, and one seeing and talking with my patient would certainly not consider her suffering from any illness. This case has been reported and the others cited in order that the attention of the profession might be directed to the desirability of reports of similar cases, so that a proper knowledge regarding the effects of pregnancy and labor upon the remaining kidney following nephrectomy may be obtained. I have no doubt other members of this Association have met with cases similar to these cited, and I trust this paper may be an incentive to the report of all such cases. To my mind there is little doubt that pregnancy and labor following nephrectomy seriously jeopardize the life of the patient; that the renal complications must necessarily be greatly increased, and therefore induction of premature labor and other forms of treatment of these complications more frequently necessitated. In these cases the evidence of permanent impairment of the remaining kidney as a result of pregnancy and labor is by no means convincing, but my individual opinion is as records are made of such cases such effects will be apparent.

DISCUSSION.

Dr. Richard Douglas, of Nashville.—We are all familiar with the work Dr. Bovée has done in this line, and I have followed him somewhat and consider him as an authority. I am much interested in this particular case because it appeals directly to me.

For the last ten days I have had under study a case of tubercular kidney in a woman who is two and a half or three months pregnant, and the question comes up as to what procedure is proper in these cases. I have had a most careful analysis of the separate urines made by our pathologist, Dr. Leroy. The diagnosis seems clear. I attempted to catheterize the ureter but could not do so, and I had to rely upon the

segregator. Nevertheless, the analysis made by Dr. Leroy proves conclusively that the diagnosis is tubercular kidney. She has a large, tender, and, strange to say, movable kidney, and, in passing, I would say, I think movable kidneys are decidedly predisposed to tubercular infection, but become fixed when involved.

Dr. Bovée has shown that pregnancy materially jeopardizes the life of the woman who has had one kidney removed. Is not, then, a nephrectomy on a pregnant woman, when the efficiency of the other kidney is a doubtful question, a doubtful procedure? That is the question in point. So I have hesitated to perform nephrectomy in my case. I am not familiar with any case of pregnancy after nephrectomy, therefore cannot speak directly to the point in the paper.

The whole question of nephrectomy is one that is very interesting to me, and one in which I think we have much to learn. I do not think an analysis of the separate urines is a conclusive test of a woman's competency to stand an operation. I would further state, that death does not always occur immediately after nephrectomy, and in this connection I might be permitted to report a case in which some three weeks ago I did a nephrectomy. I was satisfied that the remaining kidney was competent. The patient did well; she passed abundant urine, showing considerable eliminative capacity. But on the ninth day, after a perfectly afebrile course, the woman, apparently in good condition, suddenly developed acute dilatation of the stomach, and died in sixteen hours. Autopsy showed that the stomach alone was involved. It was the largest stomach I ever saw, in that it completely filled the abdominal cavity, reaching down to the pubes.

Dr. Charles P. Noble, of Philadelphia.—The point I wish to speak of is with reference to pregnancy following nephrectomy. The first nephrectomy I did was in a case of advanced tuberculosis, there being a perineal abscess which was pointing in the loin, and pus just under the skin when the patient was first seen. That woman has had two children, one child I know of, and was pregnant again. Whether she had a miscarriage or a second child, I do not know. This was several years ago. She certainly recovered from the second pregnancy, no matter how it terminated. The case was reported before the Pennsylvania State Medical Society in 1899, with a list of other nephrectomies.

As to the ultimate outcome of nephrectomies, it may be of interest to say that all of the patients upon whom I have done a nephrectomy, except one who had cancer, are still living. Most of these cases are also of interest as regards the "other kidney." The urine from the opposite kidney in most of them contained casts at the time of the operation; in other words, it need not at all be a contraindication to nephrectomy to find the other kidney is not healthy provided the one you remove is thoroughly diseased. In these cases, most of them, the kidneys were absolutely functionless, as shown by the catheterization of the two ureters, and it was quite clear that the remaining kidney was being crippled by septic poisoning. In kidneys that are septic from stone or other causes, the opposite kidney is inflamed from sepsis, and the only way to cure the better kidney of the two is to take out the diseased one. I removed one kidney from a man who already had septicæmia at the time of the operation, and who died three weeks later; but all of the women upon whom I have operated for suppurating kidneys are alive.

Dr. Edwin Ricketts, of Cincinnati.—Some six years ago a woman, aged twenty-eight years, the mother of one child, was referred to me by Drs. Wells and Gibbons, of Kentucky. She was three months pregnant. On examination a tumor of the left kidney was found. She suffered a great deal from pain. Nephrectomy was done, but it did not interfere with her pregnancy. She went on to full term. In the course of two years she became pregnant again, and went on to full term without any trouble.

Dr. Miles F. Porter, of Fort Wayne, Indiana.—I would like to ask this question, Whether or not catheterization of the ureters is sufficiently free from danger in these cases to warrant it being undertaken as a diagnostic procedure looking toward a possible nephrectomy? In these cases my own idea is that it is not free from danger; that there is a great deal of danger of infecting the healthy kidney, and, on the other hand, finding you have another kidney somewhat damaged, it does not contraindicate nephrectomy, even though it be found.

Dr. J. H. Carstens, of Detroit.—Four years ago a young woman came to me, who was about eighteen years of age, suffering from sepsis. She had chills, elevation of temperature, etc. She had a tubercular suppurating kidney. I drained the kidney, believing that she was too weak for me to remove

it. She was very anæmic and badly run down. After draining the kidney she improved immediately, developed a voracious appetite, rapidly increased in weight, so that in about seven weeks I was able to remove the kidney on the left side. A little over a year after that she got married; a year later she was delivered of a child. I reported the case first along with some other cases of kidney operations. I have not heard from her since she became pregnant again. The point to me is this: Here was a kidney absolutely destroyed and without function; the pathological process came on gradually, consequently the healthy kidney became hypertrophied and was doing more work until finally it did the work of the two kidneys before I operated. In almost all cases that we operate on one kidney does double work. When a woman becomes pregnant, I see no reason why pregnancy should not continue just as well with the one kidney, which does the work of the two kidneys, as though she had two kidneys. So there is no reason why it should interfere with pregnancy. When we consider the question of pregnancy, as Dr. Douglas puts it, in the direction of interfering with the function of the kidney that is tubercular, but still functionating, I do not think we are justified in bringing about premature labor or anything of the kind, as long as there are no indications for it. The acute desquamative nephritis which we have complicating pregnancy is entirely different from the ordinary run of kidney troubles. This is not to be considered in connection with chronic Bright's disease at all. It is caused by some condition of the sympathetic nervous system. Some women, especially primiparæ, will have that condition of the kidney, but not many. Once in a while we will find the acute desquamative nephritis of pregnancy.

Dr. Bovée (closing).—I believe, as I stated in the paper, and this may be a reiteration, that where one kidney is called upon to do the work of both kidneys, the process may have been a gradual one, yet we would hardly consider the one kidney as able to stand the extra strain put upon it as would both kidneys. That is the reason the strain put upon one kidney following nephrectomy, or even without nephrectomy, if the function of the other kidney is suspended for an indefinite period of time, is greater than the strain upon both kidneys in a healthy condition.

As regards the removal of the kidney during pregnancy, that was not considered in my paper, and, as Dr. Noble said, if the

diseased kidney is functionless, and is giving rise to trouble in the way of septic absorption from the accumulation of pus, is probably better out than in, yet in such a case I prefer drainage to removal of the kidney. It has been my practice, therefore, to resort to nephrotomy instead of nephrectomy during pregnancy.

I brought this matter to the attention of the Association, with the hope of getting reports of more cases. Dr. Baldwin reported to me one case that he has had. Most of these cases are lying dormant, and they ought to be put on record, with their clinical histories, so that we can formulate certain principles or rules regarding nephrectomy complicating pregnancy and labor.

Dr. Carstens' statistics do not agree with those I have been able to collect, as regards the frequency of kidney complications during pregnancy. I found one statement to the effect that 6 per cent. of all pregnant women have albuminuria. Albuminuria, we must admit, is a kidney complication. I do not say eclampsia. We sometimes have eclampsia without albuminuria; but albuminuria in the urine gives apprehension to the attending obstetrician. He should recognize it as a complication, and if we have that percentage of albuminuria in women with two kidneys, we are more apt to have the condition more frequently in women with only one kidney, and I also believe the diseased process will be greater than when it attacks the lone kidney than when there are two kidneys for this condition to be distributed over.

THE SURGERY OF THE LOWER URETER.

By Hugh H. Young, M.D.,
Baltimore, Md.

Although the lower ureter has been neglected by the surgical world until recent years, the literature has multiplied very rapidly. It is my intention to-day to outline briefly the problems met with in this field, and then to add cases of my own bearing on the subject.

In the limited time allotted to us it will be necessary to omit much of the details of the brilliant work which has been done in this field of surgery.

Anatomy of the Pelvic Ureter.

The pelvic portion of the ureter is naturally divided into two portions—the parietal or fixed, and the visceral or mobile. The parietal portion begins just after the ureter has crossed the iliac vessels, from which point it winds over the brim of the pelvis and passes downward and outward, in close contact with its lateral wall, to a point about 3 cm. in front of the spine of the ischium. At this point it makes a sharp bend inward and begins the second part of its course (the visceral) across the floor of the pelvis, on the upper surface of the levator ani muscle to reach the base of the bladder. In the first part of its course in the left side the ureter lies in front of and to the side of the internal iliac artery; on the right side it lies directly in front of and almost exactly parallel with it. On the left side the rectum lies in relation to the ureter in the first part of the pelvic course; but as the ureter passes outward it is sepa-

rated from it by the parietal peritoneum, which covers it, and it is only in relation to the rectum when it is over-distended. On the right side the ureter is never in relation to the rectum, being considerably distant from it. The ureter is crossed by the two branches of the hypogastric, the obturator and the umbilical, both of which pass in front of it.

In the second part of its course it is separated from the rectum by the levator ani muscle, and lower down just before its entrance into the bladder by the top of the seminal vesicle. The ureter is here crossed at right angles in front by the vas deferens, which winds around it from the lateral wall of the bladder, on its way to the upper end of the prostate. The peritoneum covers the ureter down to a point about 2 cm. from the junction of the bladder, when it is reflected upward to cover the posterior surface of this viscus. For the space of 2 cm. the ureter is loosely held to the bladder by connective tissue, and one may cut through the bladder into the ureter without getting into the peritoneal cavity.

To the outer side of the ureter the peritoneum dips downward around the upper end of the seminal vesicle, the upper end of which is thus separated from the rectum by two layers of the peritoneum. As the seminal vesicles lie beneath the ends of the ureter, the danger of opening the peritoneal cavity when attempting to reach the ureter from the perineum is manifest.

The course of the ureters through the bladder wall is obliquely downward, inward, and forward for a distance of about 18 mm., when they terminate in oval or slit-like orifices, enclosed on each side by small folds of vesical mucous membrane, which act as valves.

Delbet[1] says that the trigone is really formed by an expansion of the muscular fibres of the ureters. Having arrived at the level of the bladder the longitudinal fibres of the ureters cross in front of the vesical wall proper. Some fibres pass behind and terminate in the plexiform

layer; the others, much more numerous, spread out in the shape of a fan. (Fig. 1.)

The posterior fibres proceed transversly inward and become continuous with the fibres from the ureter opposite, thus forming the interureteral muscle (Mercier's bar). The fibres which constitute this muscle are fine and compact, they pass in front of the fibres proper of the bladder, from which they are separated by a layer of fibrous tissue. The anterior fibres pass obliquely forward and inward, and, describing concentric curves, assist in forming the sphincter of the bladder. Some superficial fibres run in a direction nearly antero-posterior, and, gliding under the mucosa of the vesical neck, are continuous with the internal longitudinal layer of the urethra. The trigone as thus formed is a very strongly fixed body, and the ureteral orifices are firmly held together and maintained in their oblique course. Even with considerable over-distention of the bladder the interureteral distance is little disturbed. According to Glantenay,[3] the ureter preserves its own muscular coats, which are separated by a layer of connective tissue from the surrounding bladder muscle.

The calibre of the intramural ureter is much narrower than above the bladder, but not as narrow as at its orifice. No definite ureteral sphincter has ever been demonstrated, but the trigonal muscle fibres which surround it evidently serve such purpose, as it is impossible to cause a reflux of the fluid from the bladder into the ureter by even the greatest intravesical distention, as was demonstrated by the writer[4] in 1898 (see therein a discussion of the ureteral reflux and reversed peristalsis).

The mechanism of intermittent evacuation of urine from the ureters varies in different subjects. As seen through the cystoscope it is generally as follows: The orifice is first opened and drawn backward and outward. The urine then begins to flow in a swift stream. The muscle of the trigone then contracts and the orifice is drawn forcibly downward and closed as the last urine escapes. At

times the muscle action is very slight, and, the outflow of the urine being less vigorous, is more difficult to detect.

In the female the first or parietal portion of the pelvic ureter is similar in its course and relations to that portion in the male. The second part runs forward and inward beneath the broad ligament at a distance of about 2 cm. from the side of the uterus. Lower down it rapidly approaches the lateral wall of the vagina, and passing obliquely in front it lies in the last 1 cm. of its course (above the bladder) in direct contact with the anterior wall of the vagina. During its intramural course the posterior wall of the bladder is closely adherent to the anterior vaginal wall. The uterine artery and veins accompany the ureter in its course, being closely adherent to it, but as the ureter passes out of the anterior surface of broad ligament, the vessels turn inward in front of it.

The measurements of the pelvic portion of the ureter vary considerably in different subjects, being largely dependent upon the size and shape of the pelvis and the condition of the muscular.

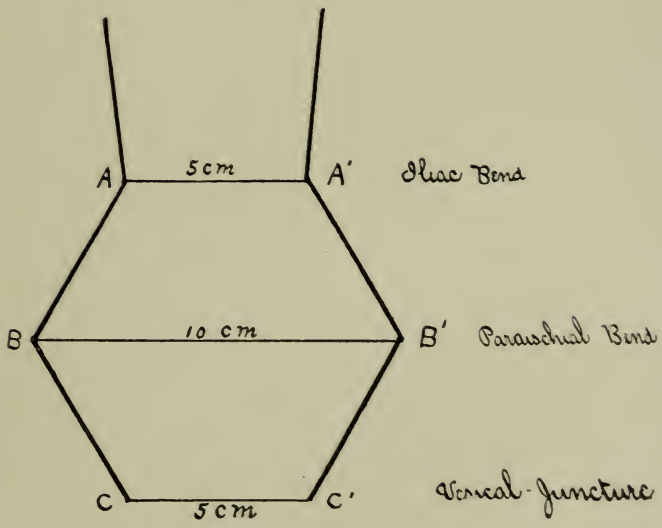
It is an interesting fact, which I called attention to in another paper,[22] that the pelvic course of the two ureters may be represented with fair accuracy by a hexagon, the sides of which are each about 5 cm. in length, as shown in the accompanying diagram.

Measurements of the distance between the two ureters show that they are about 5 cm. apart at the brim of the pelvis where they cross the iliac arteries, and also about 5 cm. apart where they enter the posterior wall of the bladder. At the paraischial bend they are about 10 cm. apart, or double the distance above and below. Measurements also reveal that the distance from the bend at the pelvic brim to the paraischial bend is about 5 cm., and that the distance from this point to the entrance into the posterior wall of the bladder is also 5 cm. The course of the ureters within the pelvis, therefore, forms quite a perfect hexagon, each limb (radius)

Fig. 1.

Showing the musculature of the trigone.

Fig. 2.



The ureteral hexagon.

of which is 5 cm., as shown in the diagram ; thus, A and A′ represent the bend of the pelvic brim, and are, of course, 5 cm. apart. B and B′ represent the paraischial bends, and are, of course, 10 cm. apart (double radius), C and C′ the points of the junction with the bladder, and also 5 cm. distant. A B, A′ B′ and B′ C′ are likewise 5 cm. We see that such a hexagon corresponds quite accurately with the average anatomical distance of the ureters and gives at once an easy and fairly accurate idea of their intrapelvic course. In the female a hexagon with sides 6 cm. long is more accurate than 5 cm., the distance being this much greater than in the male. (Fig. 2.)

Turning to the conditions requiring surgical interference, in the literature we find the following :

Anomalies: prolapse, ureteritis, calculus, fistula of ureter, tumors, valve formation, stricture.

Anomalies. 1. As to number: The most common is that of double ureter on one side. The ducts generally enter the bladder side by side, and both orifices may be seen with the cystoscope. Sometimes the two ureters join at some point between the bladder and the kidney, and present only one orifice in the bladder.

Cases of double ureter on each side have been recorded, and Morris asserts that the second ureter has proved valuable, its mate having become blocked by calculus.

2. As to location of the termination: The following classifications are given by Delbet :[1] (*a*) In the bladder. The course of the ureter through the bladder wall may be much too long or the lumen may be congenitally strictured. Schartz reported a case in which the end of the ureter was closed and the dilated part above was separated from the bladder by a double layer of mucous membrane. (*b*) In the rectum. Termination in the rectum has occurred, but always in monstrosities. (*c*) In the prostate. In the male the ureter has been found to open in the veru montanum and in other parts of the prostatic urethra. It has also been found to open into the ejaculatory ducts, the seminal

vesicles, and vasa deferentia. (*d*) In the female. Into the vagina, the uterus, the prepuce of the clitoris, and the urethra.

According to Morris, these anomalies are directly dependent to errors of development and are usually associated with congenital deformities. Those into the lower part of the vagina or rectum are seldom found except in monsters. As the abnormal orifice is almost always narrowed, dilatation of the ureters above is generally present. When the termination in the bladder is blind there is generally a thin-walled intravesical tumor in the region of the ureter (prolapse). Fenger,[5] in a very thorough discussion of the subject outlines the treatment as follows : The abnormal termination of open ureters in the genital apparatus in man will probably not be diagnosed, and consequently not be an object of treatment. On the other hand, the abnormal termination of the ureter in the vulva, vagina, or urethra in woman has already often demanded surgical interference, with the object of curing the incontinence. The operation has for its object the direction of the abnormal ureter into the bladder as near as possible to the normal place and the exclusion of the distal end of the ureter from the passage of urine.

The following methods have been used or proposed :

1. Epicystotomy—implantation of the ureter in the posterior wall of the bladder and obliteration of the peripheral end.

2. Excision of the distal end of the abnormal ureter—vaginal implantation of the proximal end into the bladder.

3. Extraperitoneal isolation of the abnormal ureter and the bladder through a convex subpubic incision, and resection of the lower border of the symphysis. Through this wound the ureter is isolated and its central end implanted into the bladder.

4. Uretero-cystostomy—a communication made between the bladder and the dilated portion of the abnormal ureter. Wölfler effected this with apparent success by

means of a special instrument analogous to Dupuytren's enterotome.

Criticism of the methods. "Epicystotomy and implantation of the ureter in the posterior wall of the bladder, although successfully performed by Tuffier and Baumm, is a more grave operation than the vaginal implantation. The same may be said of the extra-peritoneal implantation with partial resection of the symphysis as successfully performed by Colzi. To make a direct communication between the dilated ureter and the bladder, as done by Wölfler and Bois, is technically difficult. Thus the operation from the vagina is probably the safest method, and should be first attempted. If unsuccessful, one of the other methods might be resorted to."

Prolapse of the Ureter into the Bladder.

This is a rare anomaly, judging from the fact that only about seventeen cases have been recorded. The prolapse may be congenital or acquired. Of the fourteen cases collected by Blumer ten were evidently of congenital origin, and in five cases led to death early in life. The deformity in these congenital cases consists for the most part in a partial or complete closure of the lower ureteral orifice. The terminal prolapsed portion of the ureter may alone be dilated, the ureter above being normal. On the other hand, there may be a uniform dilatation of the entire ureter.

Of still another variety is a case previously reported by the writer[7] in which there was present a ballooning of the ureter while it was functionating, but which would disappear as soon as the outflow of urine ceased. (See history, Case I., in Appendix.)

The etiology of all these cases is probably to be ascribed to the stricture at the orifice of the ureter. Dickinson ascribes the subsequent prolapse to the downward pressure exerted by the swollen and rigid cylinders (ureters). But dilated ureters are common at the autopsy-table, being

present in numerous cases of prostatic hypertrophy, but we have never seen a case of prolapse among them.

Burckhart held that the abnormality came from congenital lack of musculature of the bladder wall. Boström held that it was due to the ureter passing not obliquely but straight through the bladder wall.

I think my case showed that neither was correct, but that the dilatation occurs first in the intravesical portion of the ureter above a stricture around the orifice of the ureter. (First, a collapsing balloon, as in my case.) Later the dilatation proceeds upward, destroys the sphincteric character of the surrounding muscle, and the balloon becomes permanently filled, the so-called prolapse, with ultimately dilatation of the entire ureter and renal pelvis.

The following very interesting case was reported by Caillé:[8] A female child, two weeks old, presented a rounded tumor the size of a walnut protruding from the urethra. After a careful examination it was found that the tumor was a prolapse of the right ureter, which was greatly dilated externally, but connected with the interior of the bladder by a narrow pedicle. This was ligated and divided. The child died, and autopsy showed marked dilatation of both ureters.

Ureteritis.

This may be simple or tuberculous, and is not different in the lower ureter than in the upper, except that it is much more apt to lead to stenosis at the lower end. It is principally on account of its diagnostic value that I wish to discuss it here.

The ureteral orifice is very apt to appear congested when the kidney above is the seat of disease, even slight in character.

When the kidney is the seat of inflammation the changes in the ureteral orifice often become very marked—the most common being: hyperæmia, swelling or eversion of the

surrounding mucosa, and contracture of the orifice, which may be changed from a slit to a small round hole situated at times from the top of the cone-like projection.

The following cases show the diagnostic value of cystoscopic inspection of the ureteral orifices: In the first case the patient, a man, had had symptoms suggesting ureteral calculus of the left side for three years. The radiograph showed no calculus and the urine contained so little pus that its source could not be detected by the plain cystoscope. Inspection of the ureteral orifices showed the right to be normal in every way and emitting jets of clear urine. The left ureteral orifice, on the other hand, was distinctly abnormal, the ridge much enlarged, and at the proper location for the orifice there were numerous small polypoid projections of mucous membrane which floated in the vesical fluid. It was impossible to make out the orifice or the urine coming from it. The bladder was normal. The extraperitoneal operation was performed. The ureter was found markedly enlarged and thickened throughout its entire length, and examination of the kidney showed it to be tuberculous. Nephro-ureterectomy was performed.

In this case the left ureter could not be catheterized, and the appearance of the ureteral orifice alone indicated the diseased side. The urine obtained by catheter from the right ureter was normal. (See complete history, Case II., in Appendix.)

In another case a male with indefinite symptoms referable to the left kidney, but in which the urine was normal, the cystoscope showed an extensive bulging of the bladder wall about a much-contracted left ureteral orifice. The ureter catheter met with an impassable obstruction just above ths orifice. When the ureter was exposed by extraperitoneal operation a stone about the size of an almond was found impacted in it just above the bladder. (Case V.)

In the two other cases, however, in which small stones were impacted in the right ureter within 4 cm. of its end,

the orifice showed no abnormality, but the ureteral catheter and X-ray made it clear that a calculus was present not far from the orifice.

Calculus of the Lower Ureter.

The ureter has four points of congenital narrowing, viz., below the renal pelvis ; where it crosses the brim of the pelvis; at its vesical junction; and at its orifice in the bladder.

The calculus which passes the first two may become lodged in either of the last two. Calculi are found elsewhere in the pelvic ureter, especially in its paraischial portion, probably owing to the rather sharp bend made by the ureter at that place. These points of predilection, are graphically shown in the accompanying charts, viz., the paraischial, the juxtavescial, the intramural, and the intravesical. (Figs. 3, 4, 5, 6, 7.)

In the female that portion of the ureter lying within the broad ligaments is frequently narrowed by disease of the female pelvic organs, and furnishes quite a common point for the impaction of the calculi.

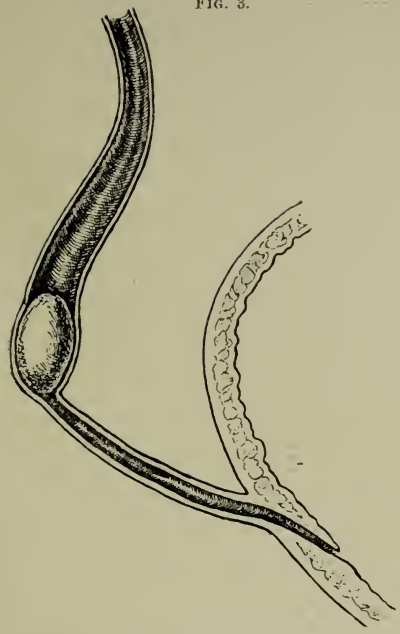
In the male calculus of the lower ureter is apparently very rare, and in a recent study of the literature I was able to collect only eighteen operated cases, including two of my own.[22] I can now add another case which I have recently operated upon, thus making nineteen cases.

The location of the impaction was as follows : Juxtavesical, 8 ; intravesical, 5 ; paraischial, 1 ; intramural, 3 ; juxtavesical and paraischial, 1 (3 stones) ; juxtavesical to iliac, 1 (17 cm. long).

Various routes have been employed for the extraction of these calculi, and the results obtained were as follows:

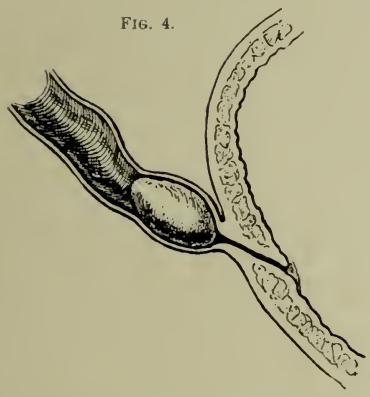
1. Intravesical, 9; result not noted, 3; recovered, 6.
2. Perineal (prerectal), 1; recovered.
3. Intrarectal, 1; died.
4. Iliac (extraperitoneal), 8; recovered, 6; died, 2.

Fig. 3.



Calculus impacted in paraischial portion.

Fig. 4.

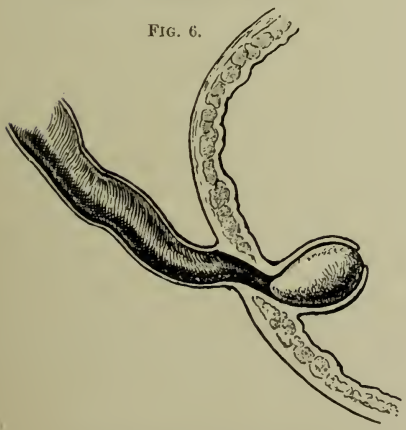


Calculus in juxtavesical portion.

Fig. 5.

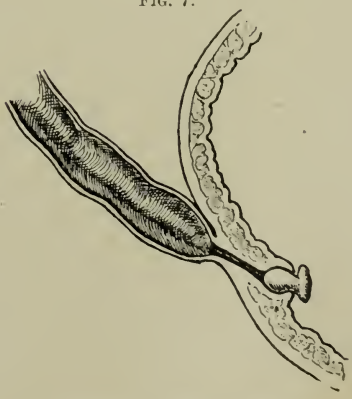
Calculus in intramural portion.

Fig. 6.



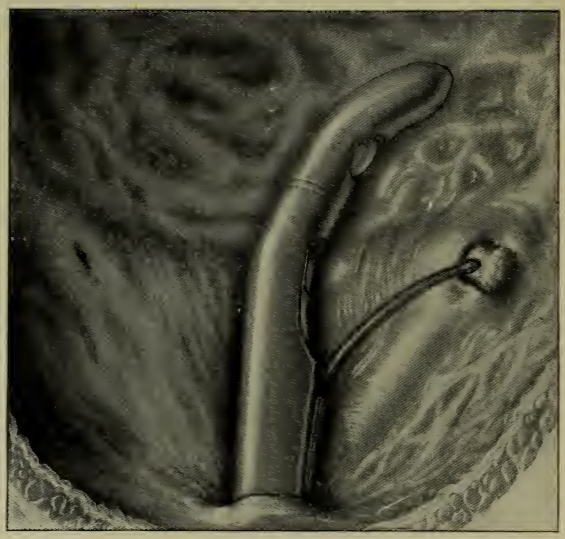
Intravesical ureteral calculus.

Fig. 7.



Intravesical ureteral calculus.

Fig. 8.



Cystoscopic extraction of intravesical ureteral calculus.

Fig. 9.

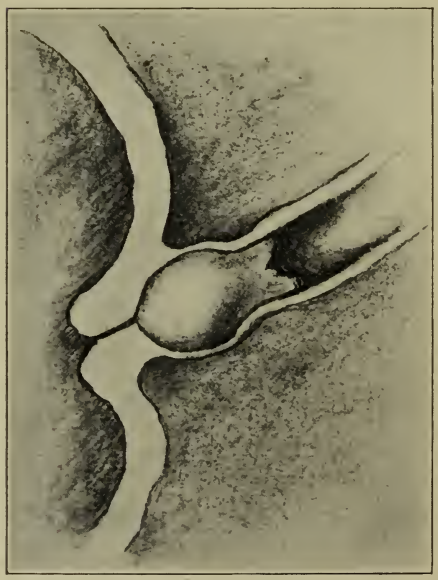


Diagram showing the stricture of the intramural ureter with the calculus impacted just above it in Case V.

Total, 19 cases; result not noted, 3; recovered, 13, died, 3.

1. The intravesical route has been used in the male in three ways: (*a*) Through a perineal urethrotomy; (*b*) through a suprapubic cystotomy, and (*c*) through the urethra by means of a male catheter cystoscope, and by a lithotrite.

The suprapubic method has been used in six cases, with success in each case. In all of these cases the stone was impacted in either the intravesical or intramural part of the ureter. In two the operator thought he was dealing with pedunculated intravesical tumors.

Harrison detected with the cystoscope a calculus protruding from the ureter, and removed it with a lithotrite.

Cystoscopic extraction has been employed once in the female, by Hall, of Cincinnati, who dislodged the stone by means of a probe through a Kelly speculum, and once in the male by the writer.

In my case the stone, which had given rise to symptoms both renal and vesical for three months, was found protruding from the orifice of the left ureter and dislodged by means of the male ureter catheterizing cystoscope of Casper. The manœuvre is sufficiently shown in the accompanying drawing (Fig. 8). (See Appendix, Case IV.)

In the female intravesical and intramural impaction may be reached through the urethra, or through the vesicovaginal septum. Kelly[9] reports a case of intramural calculus removed through this route, the patient being in the knee-chest position and the bladder distended with air.

2. The perineal-prerectal route has only been employed by Fenwick,[10] who made a transverse incision in the perineum, separated the rectum from the prostate, and thus exposed the ureter with a calculus impacted in the juxtavesical portion. The stone was removed through a longitudinal incision. The ureter was drained, and the patient recovered. Fenwick thinks this the method of

choice where the calculus is low down in the ureter. Regnier[11] tried to reach the ureter in this way, but was unable to do so, and had to employ the iliac route.

3. The intrarectal route has been employed but once, and that with fatal result. It has nothing to commend it.

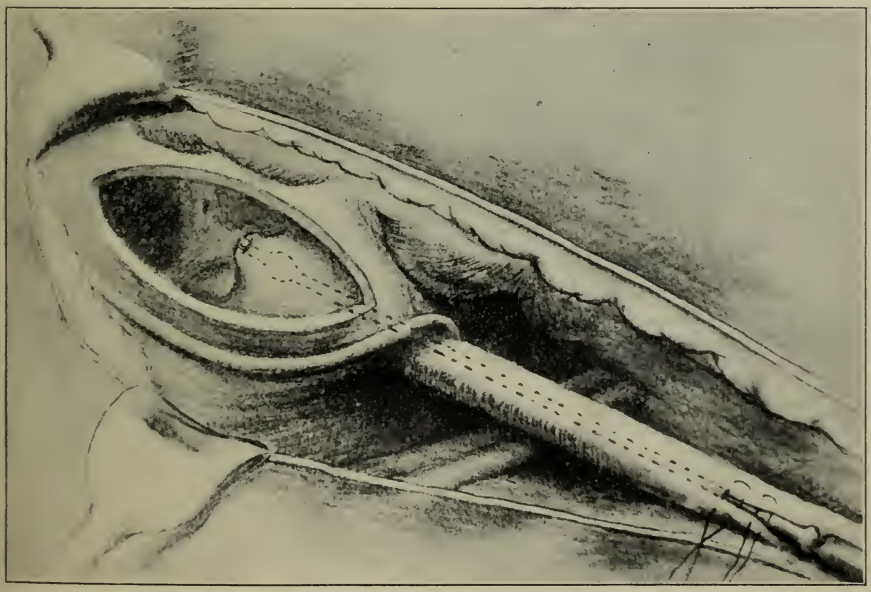
4. The iliac (extraperitoneal) route has been used in the male nine times by six operators—Kirkham, Twynam, Morrison, Israel, Finney, and the writer. These cases have been much more severe as a rule than those operated on by other methods, and in three cases complete nephro-ureterectomy was done. There were, however, only two deaths, one due to calculous disease of the other ureter and kidney, and the second to heart failure. Both of my cases recovered. The first was a man twenty-nine years of age who had had symptoms of the calculus of the left ureter since two years old. The cystoscope showed a bulging of the bladder wall above the left ureteral orifice, and the ureteral catheter met with an obstruction 1 cm. above. In the radiograph the shadow of a calculus the size of an almond appeared in the left half of the pelvic space. The calculus was removed extraperitoneally by the iliac route, and the ureter sutured. A stricture was found at the intravesical end of the ureter, and, as it could not be dilated from above, was divided intravesically through a wound in the lateral wall of the bladder. There was no leakage. Ultimate result good. (See Appendix, Case V., and Figs. 9, 10, 11, 12, 13.)

The second case was a man, aged twenty-five years, who had had symptoms of calculus of the right ureter for five years. The urine was normal. The cystoscope showed a healthy bladder, but the ureteral catheter met with an obstruction about 4 cm. above the vesical orifice, and the X-ray demonstrated a small calculus in the right half of the pelvic space. The calculus was removed as in the first case. It was found tightly incarcerated in the ureter about 1½ cm. above the bladder. Stricture of moderate degree was present below the calculus and was dilated by

Fig. 10.

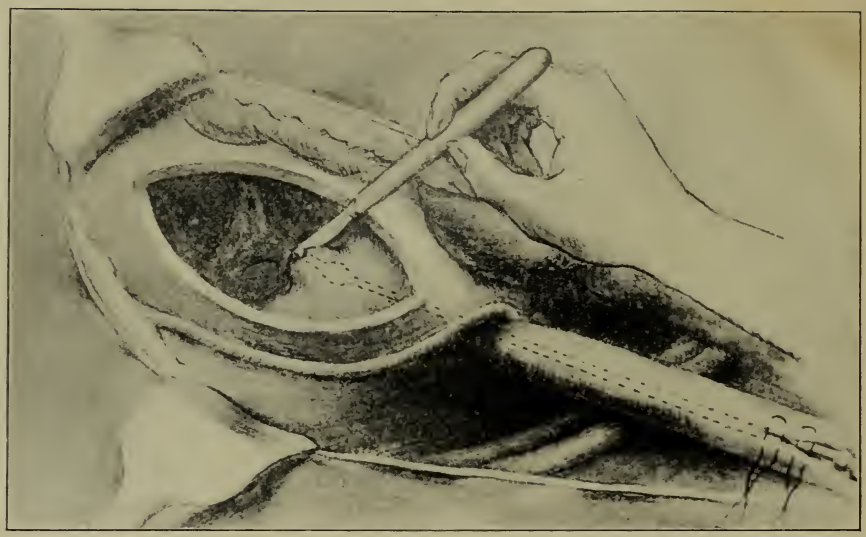
The calculus used as a bobbin to place the sutures after having been pushed up to a point in the ureter above the pelvic brim.

Fig. 11.



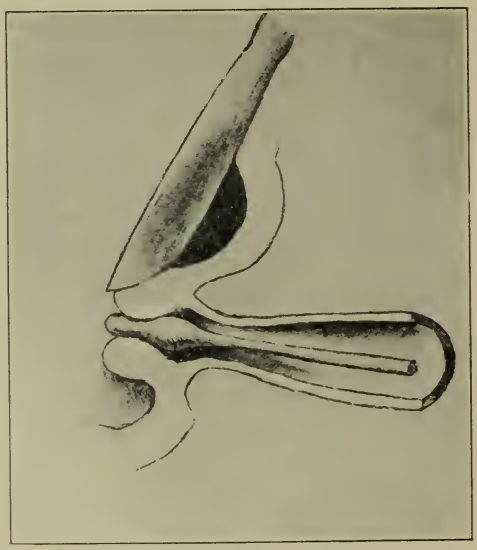
Showing the lateral incision into the bladder, the vas deferens, the dilator in the ureter with its point protruding into the bladder through the stricture.

Fig. 12.



Showing the intravesical division of the stricture upon the ureteral dilator.

Fig. 13.



Another diagram showing the division of the stricture upon the ureteral dilator.

bougies. The patient made a good recovery, and there was no leakage. (See Appendix, Case VI.)

These two cases serve to demonstrate the efficacy and simplicity of extraperitoneal iliac operation. In both the calculi were at the vesical junction of the ureter (juxta-vesical portion). As late as 1898 Fenger asserted that this portion of the male ureter was beyond the reach of the surgeon.

In the female, according to Schenck,[12] ureteral calculi have been extracted through the urethra about eight times, with one death, and the vagina fifteen times, with one death. Morris twice removed a calculus from the pelvic ureter in the female through a pararectal incision. The incision was made parallel with the sacral spines, the edge of the gluteus maximus and the sacrosciatic ligament were divided, the ureter incised, and the stone extracted. Morris prefers this route to the iliac route in both male and female.

The intraperitoneal or abdominal route has been employed several times in the female, but never in the male for this portion of the ureter. This route is quite generally condemned.

The iliac route has seldom been used in the female for extraction of calculi of the lower portion, Israel being a notable exception.

The Choice of Route for Stone of the Lower Ureter.

As outlined above, surgeons are far from agreed on this question. When the stone is intravesical or intramural all are agreed that it should be removed through the bladder. The simplest means are with the cystoscope, as in the two cases detailed above. If projecting well into the bladder the lithotrite may suffice to extract it, as in Harrison's case. In the female after dilating the urethra forceps may be introduced and the calculus withdrawn.

If none of these suffice, or the stone is intramural (and, therefore, out of reach of such methods), suprapubic

cystotomy in the male and vaginal cystotomy in the female, after the method of Kelly,[9] should be done. When the stone lies in the juxtavesical ureter, in the last 2 or 3 cm. which are in close apposition to the vagina, it can be most easily removed by the vaginal operation. The objection to the method is the danger of a ureteral fistula persisting and the inability to inspect and explore the upper ureter and kidney. When the calculus is higher up in the female ureter various objections to the vaginal operation present themselves, which will be discussed later on.

Calculus of the deep pelvic ureter in the male has received much attention, but there is still little unanimity of opinion in the literature as to the proper method of attacking it.

Cabot,[13] in 1892, deeming the iliac extraperitoneal operation inadequate for calculi of this portion of the male, suggested that the ureter might be reached through a Kraske sacral flap operation.

Le Dentu held this portion of the ureter to be inaccessible in the male and in 1898 Fenger indorsed this view.

Writing in 1898, Fenwick[10] said that a calculus below the pelvic brim should be removed by the perineal-prerectal route, which he had employed in one case (which, however, was juxtavesical). In 1901 Morris[12] said "when a stone is impacted in the ureter near its lower end, but too far off to be removed through the bladder, or the vagina, the sacral route should be employed." In the male he advised the prerectal or perineal route of Fenwick. Schenck,[12] in 1901, said, "when located within two inches of the bladder, the choice is between vaginal ureterotomy, rectal ureterotomy, vesical ureterotomy, or perineal ureterotomy."

Thus we see that up to the last year only three published cases of the iliac extraperitoneal operation for stone in the lower pelvic ureter of the male were on record, one in a child, the others in adults, and with one fatal result. The view was generally held that this portion of the ureter could

not be reached by the extraperitoneal iliac route, and the French were advising nephrectomy rather than an attempt at removal of the calculus.

Late in 1901 Israel's book[15] appeared. In it were published three cases of calculi removed from the deep pelvic ureter in the male by the extraperitoneal iliac incision, and four cases in women in which the same route was employed for stones which could be felt per vaginam. In these seven cases Israel had two deaths, one male and one female, both due to heart failure. His case disproved at once the prevailing opinion, that the pelvic ureter was beyond the reach of the extraperitoneal iliac operation.

Before Israel's book appeared in America, Finney and the writer had each successfully removed calculi which were impacted in the deep pelvic ureter by the iliac extraperitoneal route. These cases were reported by the writer in the *Transactions of the Philadelphia County Medical Society*, March 12, 1902. Since then I have had an additional case.

In each of my cases, although the calculus was incarcerated in the ureter at its vesical juncture, it was readily exposed, dislodged, pushed upward in the ureter to a point above the pelvic brim and there removed through a small incision, which was easily closed by sutures.

It has, therefore, been demonstrated by six cases published within the last year that the deep pelvic portion of the male ureter is just as accessible by the extraperitoneal operation at the upper ureter, and that calculus of even the juxtavesical ureter can be removed with ease.

The only other methods which have been employed are the intrarectal, which was used by Ceci with fatal result, and the perineal-prerectal, which is manifestly only suitable for calculi immediately above the bladder, and has several great disadvantages, viz., the inability to examine the ureter and the kidney above or to determine the presence of stricture below, the danger of entering the peritoneal cavity, especially when the seminal vesicle is the seat of chronic inflammation, and the inability to suture the

ureter after removal of the stone. One operator (Regnier) who attempted to reach the ureter by this route failed, and had to resort to the iliac.[11]

The iliac route, on the other hand, has many advantages, viz., the ability to explore the kidney and the ureter above and below, to dilate or incise a stricture below, as in my case, to close the ureteral wound by sutures, or to perform nephro-ureterectomy if necessary (as in Israel's case, where the stone was 17 cm. long). Considering, then, that the perineal route has only been used successfully once, that at least one surgeon has failed with it, that the wound is narrow, deep, and dark, and the procedure encumbered with numerous disadvantages, as outlined above, I cannot agree with Fenwick and Morris, authorities though they be, in considering it the method of choice in the male, but feel convinced that the iliac route is the only justifiable method.

As to the method of choice in the female I cannot speak from personal experience. Although I am aware that a number of cases in which surgeons have removed through the vagina calculi from the lower end of the ureter are to be found in the literature, I am also aware that it has at times been impossible to reach them by this route. Morris himself says that the method is only applicable to stones of the juxtavesical portion, and not for those of the paraischial or parasacral portions of the ureter. For these high lodgements he advises the pararectal route, which he has twice employed in the female. Out of six cases of calculus of the pelvic ureter in females, Israel has only twice successfully employed the vaginal route. In each of these cases the stone was small and lay in the juxtavesical portion immediately adjacent to the vagina. In two other cases in which the calculus was impacted in the paraischial portion, and, therefore, was separated from the vagina by the intervening subligamentous tissue, all attempts to reach the calculi failed, and he had to resort to the iliac route for their removal.

In the two remaining cases Israel adopted the iliac route without attempting the vaginal.

These cases show very conclusively that calculus of the pelvic portion of the ureter in the female cannot, and should not, always be attacked from the vagina. Morris admits this, but advises the use of the pararectal route, which involves a division of the gluteus muscles and sacrosciatic ligament, and requires great care to be taken to avoid injuring important vessels and nerves. This method is certainly not nearly as simple or as thorough as the iliac route.

It seems very clearly proven then that calculi of the pelvic portion of the ureter in both male and female can be most easily extracted by the iliac route, which is greatly to be preferred, for the many reasons set forth above, to any of the inferior routes, with the possible exception of the juxtavesical portion in the female, in which calculi are very close to the vagina. The frequent persistence of fistulæ after the vaginal incision may yet prove the iliac method to be the most satisfactory for even these cases.

Fistula of the Lower Ureter.

This may be congenital or acquired. The congenital forms have already been described under the subject of anomalies.

The acquired variety may be due either to injuries during childbirth from the obstetrician's forceps or to the prolonged pressure of the fœtal head. A more common cause is instrumental injury during operations for diseases of the female pelvic organs, particularly carcinoma of the cervix uteri. In nearly all cases the fistula opens into the vagina, according to Stoeckel,[16] who has made an exhaustive study of the subject; spontaneous healing occurs in a very small number of cases. The operations which have been employed are as follows:

1. Plastic operations to close the vaginal fistula.

2. Kolpokleisis—closure of the vagina and thus forming a dam for the urine which escapes into it.

3. Implantation of the upper segment of the ureter into the bladder, the rectum, or the skin.

4. Anastomosis of the ends of the ureter divided at operation.

5. Nephrectomy.

Of these methods, kolpokleisis, implantations into the rectum and the skin, and nephrectomy are now seldom employed.

Attempts to close the vaginal opening have been so often unsuccessful that when anastomosis of the two ends of the ureter cannot be done, extraperitoneal implantation into the vertex of the bladder seems to be the operation of choice.

We have not space here to discuss the pros and cons of these various procedures, and the reader is referred to the exhaustive studies by Petersen,[17] Kelly,[18] Bovée, Stoeckel[16] and others.

Tumors.

Primary tumor of the lower end of the ureter must be extremely rare, as I cannot find a recorded case. When the renal pelvis and upper ureter are the seat of papillomatous growth, the lower end may also become involved, as in a case in which I found a polypoid tumor projecting around the ureteral orifice into the bladder, and a large tumor of the kidney present. On the other hand, the orifice of the ureter is very commonly involved in vesical neoplasms. Israel[15] says that the ureteral papilla is the place of predilection of the development of cancer of the bladder, and that contraction of the orifice with consequent dilatation of the renal pelvis occur quite soon, as a rule. He reports one case in which the ureteral orifice was surrounded by a carcinomatous growth, in which he excised the tumor with a portion of the ureter, the proximal end of which he transplanted to another

part of the bladder, with good result. A portion of the bladder surrounding the ureteral orifice may be excised without necessitating the transplantation of the ureter, as in the following case in my practice: A male, aged sixty-five years, had suffered with intermittent hæmaturia for four years. On cystoscopic examination I found a large globular pedunculated tumor covering the right ureteral orifice. Suprapubic incision was made and the tumor was found to spring from the region of the right ureteral orifice by a short pedicle 2 cm. thick. After clamping the pedicle I cut it off below the clamp with the cautery, ligated a few bleeding points and closed the bladder with drainage. The result has been good. (See Appendix, Case VII.)

Valve Formation.

Although Fenger was able to collect a number of cases of valve formation at the upper end of the ureter, I can find only one reported case for the lower end.

This is a case which has just been reported by Morgan.[19] His patient, a man, aged twenty-one years, had had attacks of intermittent pain in the left loin for four years.

At the operation a large dilated ureter was found, and on following it downward a constriction of the ureter was detected 1½ inches above the bladder. The obstruction was thought to be due to some local inflammatory action forming a band-like adhesion around the ureter. At operation a transverse band of adhesions was found across the ureter about an inch above the bladder. Above this point the ureter was dilated, forming a posterior sacculation. Within this he found a transverse fold of mucous membrane which closed the opening of the lower ureter like a valve, thus preventing the free outflow of urine. Three operations were performed, the operator finding it necessary to open the bladder twice through a suprapubic incision, and the ureter three times through an iliac extraperitoneal before he was able to cut the valvular

fold and provide free exit for the urine. The vesical incision was only used to pass catheters up the ureter, the valve being divided with scissors through the iliac wounds.

Morgan offers the following explanations: "The inflammatory bands impeded but did not totally obstruct the flow of urine. This led to a gradual pouch formation, which finally became of such size as to make a sharp angular deformity at the place of most dense adhesion, and this angular deformity led to a valvular mucous fold which intermittently completely shut off the ureteral current." The kidney was thus not destroyed.

Stricture.

Stricture of the lower ureter has only recently attracted any attention. In a recent paper on the subject Kelly[14] states that practically nothing has been said in the literature about stricture of the ureter.

I have not the time here to discuss the various causes of stricture of the ureter, and will have to omit the numerous affections of the female pelvic organs which may diminish the calibre of the ureter by pressure or direct infiltration of its walls, and devote myself entirely to the simple stricture of the lower end.

This may be produced by scar tissue around its vesical orifice, or by inflammation of the walls of the ureter itself. Stricture of the latter variety may follow the laceration produced by the passage of calculi. The irritation caused by an impacted calculus is very apt to lead to the production of stricture below it. Kolisher, Casper, Kreissl[20] and Kelly have reported cases of stricture of the ureter which have been treated by dilatation with ureteral catheters, thus permitting the subsequent passage of small calculi.[22]

In a careful study of the literature I find only three cases of operation for stricture of the lower end of the ureter.

The first case was reported by Meyer.[21] A man, aged

twenty-three years, had five years before suffered with renal colic on the left side. After that he had little trouble except a slight pain in the bladder at the end of urination. On cystoscopic examination the left ureteral mouth appeared to be swollen and ragged, the left ureteral fold more prominent than normal, projecting like a small tumor into the bladder. No fluid was seen coming from it. The ureteral catheter met with an obstruction about one-half inch above the orifice, but the right ureter was catheterized easily and gave normal urine. A diagnosis of stricture of the left ureter near its vesical end and of renal calculus was made. At operation the kidney looked healthy. There was no stone present in the pelvis, but a ureteral stricture was found six inches below the kidney. Four days later the kidney was extirpated. The wound healed well, but the patient continued to suffer pain and the urine was purulent. Meyer then operated a third time and removed the ureter. "When about to tie off the lower portion at its entrance into the vesical wall, a stone about the size of a large pea was found firmly wedged in the ureter just above the ureteral mouth. It was dislodged and removed with the entire ureter." The patient made a good recovery.

The second case was that of Israel,[15] who reports the case of a woman on whom he performed nephrolithotomy. On passing a bougie down the ureter he discovered a tight stricture above the bladder. Nothing further was done to the stricture and the kidney was drained. Afterward attempts were made to dilate the stricture by catheterizing the ureter through a cystoscope, but without success, and as the fistula still persisted eight months later, a second operation was performed, and the ureter explored extraperitoneally down to its vesical juncture. The stricture was found to begin at a point 3 cm. above the bladder and to extend down to the entrance of the ureter into the vesical wall. The ureter was severed close up to the bladder and the strictured

part resected. The bladder was then opened on a sound high up on its posterior wall, the ureter cut obliquely and its mucous membrane sutured to the mucous membrane of the bladder in one angle of the vesical incision. The rest of the bladder wound was then closed. The result was excellent. Before the renal fistula closed Israel showed by inserting a catheter into the ureter through the fistula, and filling the bladder with fluid through the urethra, that none would flow back through the new ureteral orifice unless the catheter was pushed into the bladder—thus demonstrating that the orifice had a valvular mechanism. Study of the specimen showed that the stricture was impermeable.

The third case was reported by the writer[22] in March, 1902. A man, aged twenty-nine years, with symptoms of ureteral calculus since the age of two years, was found to have a large calculus impacted in the ureter at its vesical juncture. (Fig. 9.) This was removed by the extraperitoneal iliac route, but after its extraction an impermeable stricture was found in the intramural course of the ureter, just behind its vesical orifice. (Fig. 13.) Many attempts were made to dilate this, but it was found impossible to pass even the smallest probes through its lumen. I therefore decided to divide the stricture within the bladder, which I accordingly exposed on its left lateral wall (through the original i iac incision), having to dislocate the vas deferens downward out of the way before incising the bladder. (Fig. 11.) After the bladder had been opened and the fluid evacuated, several attempts were made to pass a probe into the ureter from the bladder, but it was found impossible to push it further than 1 cm. Working with the small bulbous dilator through the ureter from above and making counterpressure in the bladder by covering the orifice of the ureter with the end of the index finger, it was finally possible to push the small end of the dilator through the stricture until its point appeared in the bladder, as shown

in Fig. 11. Around the dilator one could easily feel a hard, fibrous ring about 4 mm. thick. As all attempts to pass even the smallest ureteral instruments had failed, I decided to cut the stricture from within the bladder, and this was successfully accomplished by a long-handled scalpel as seen in Fig. 12, and as fully described in the Appendix, Case V. The largest ureteral dilators were then easily passed into the bladder. The lateral vesical wound was closed, the patient made a rapid recovery, no leakage of urine occurring. The cystoscope, six months later, showed that the divided ureteral orifice had remained slit-like and pervious.

The method used in this case would possibly have been applicable to Meyer's case, and the kidney thus have been saved. In Israel's the stricture was too high up, and transplantation was the proper operation. In another case (Appendix VI.), after removing a calculus from its impaction, 1.5 cm. above the bladder, I found below it a stricture of the ureter, but it was easily dilatable and the intravesical operation was not necessary.

The cases referred to above show the necessity of sounding for stricture of the lower ureter in all cases of ureteral calculus, or where the calculi have previously passed through the ureter, for unquestionably the breaking down of sutured ureteral and kidney wounds and the persistence of urinary fistula are often caused by the presence of undiscovered strictures of the ureter below.

It will generally be easy to dilate them with successive bougies; but when all such attempts fail, and the stricture is of the intramural portion of the ureter, the operation employed in my case may be done. The technique is simpler, and the exposure obtained through the lateral cystotomy wound excellent. Its use in Morgan's case would have done away with the extra suprapubic incision. (See valve formation.)

When the stricture is just above the bladder—in the juxtavesical portion—transplantation by the method

employed by Israel should prove satisfactory. Even when the stricture is situated several centimetres above the visual juncture the ureter may be implanted into the vertex of the bladder, if this is large enough to allow its being drawn upward some distance, and thus make up for the shortened ureter. In such cases, however, resection of the stricture with end to end anastomosis of the ureter, or the plastic, described by Fenger (longitudinal division of the stricture, with transverse closure), might be employed. But such cases do not come within the scope of this paper, which is intended for lesion of the lower end only, and has now been drawn out far beyond the length contemplated by the writer when he began it, but who still feels that he has not treated the subject exhaustively and that there is still much to be said concerning the surgery of the lower ureter.

Appendix.

Report of Cases in Full.

The following case is interesting principally on account of a peculiar intravesical balloon formation at the end of the left ureter. The history is as follows:

Case I.—J. W., aged forty-nine years. Complaint, burning on urination; swelling of testicles. No history of tuberculosis; gonorrhœa thirty years ago.

Fourteen months ago, without apparent cause, blood escaped from the urethra during an interval between urinations. Has not noticed any subsequent bleeding, but since then urination has become more frequent and irritating. He now has to get up three or four times every night to void urine. He does not know when the testicular swelling began.

Examination. A thin, rather anæmic man. Chest rather asymmetrical. On auscultation the fronts are clear, except for an occasional dry crackle of pleural origin in lower fronts. Heart normal. Abdomen negative. No tender-

ness in the region of the kidneys, or in the hypogastric region.

Genito-urinary Examination. The urethral meatus is reddened, but no discharge is present. There is a small hydrocele of the right side; the epididymis presents a nodular mass in the globus minor. The testes seem normal.

Rectal examination shows considerable enlargement and induration of the right lobe of the prostate. The left seminal vesicle and vas deferens are enlarged and indurated, and tender. The right is not palpable.

Urine. Albumin very abundant; microscopically, pus cells and tubercle bacilli present in great numbers.

Cystoscopic examination revealed very peculiar intravesical changes. The right half of the bladder was perfectly healthy in appearance, and the ureter on that side was normal. On the left side, over an area extending from the ureteral orifice around and behind the left ureter, outward along the left lateral wall, and also a portion of the anterior wall of the bladder, the mucous membrane was markedly changed, of a general deep red color; individual vessels not visible, and the surface rough, thrown into folds.

The cystoscopic picture was an unusual one for tuberculosis, showing itself more as thickening and congestion of the mucosa, without definite ulceration.

While hunting for the mouth of the left ureter a very peculiar smooth, glistening round tumor the size of a small grape was seen, but was soon lost sight of. The left ureteral ending was then found, appearing as a pinpoint opening, lying among a wrinkled mass of mucous membrane. While watching for the urine to spurt from the orifice the small, round tumor suddenly appeared, and then as rapidly disappeared. On further study it was found to rise up like a balloon at intervals of about twenty seconds, carrying with it the ureteral orifice, from which urine was ejected in a fine, forcible stream. The

balloon would remain fully distended as long as the flow of urine from the orifice continued, and then it would suddenly collapse into a mass of wrinkled mucous membrane. The orifice of the right ureter was normal.

CASE II. *Papillomatous ureteritis associated with stricture at the orifice of the left ureter; tuberculosis of kidney; nephro-ureterectomy; cure.*—R. A., aged thirty-five years, male. Complaint, pain in left side and back. Family history negative. Past history unimportant; has never had gonorrhœa.

Present illness began three years ago with an attack of severe pain beginning in the left lumbar region, and radiating from there downward into the left groin, and to the end of the penis. This attack lasted about one-half hour, and the patient remained free from pain for about two weeks, when another attack similar to the first came on. Since then these attacks have come on at intervals varying from two days to a week or more. They were always similar in character, were never associated with hæmaturia or pyuria (according to the patient), and no calculus has ever been passed. Of late he has had fever and night sweats, and micturition has become more frequent, occurring about every two or three hours.

Physical Examination. A healthy looking man ; lips of good color, no arterio-sclerosis. Chest well formed ; lungs and heart negative. Abdomen full and rather fatty, and examination, therefore, unsatisfactory. Neither kidney palpable and no tenderness on deep pressure over them, nor along the course of the ureters. Genitalia normal; no urethral discharge. Rectal examination: Prostate and seminal vesicles indurated and tender, but the secretion obtained by massage is practically normal and contains no pus cells. No enlargement of the left ureter can be made out.

Urine. All three glasses cloudy ; microscopically, pus cells; no bacteria present (later tubercle bacilli were found).

Cystoscopic Examination. Nitze plain cystoscope easily introduced. There is a moderate amount of inflammation present in the region of the trigone. The orifice of the right ureter is normal in appearance, and from it there are emitted spurts of clear urine. The region of the left ureteral orifice is distinctly abnormal; the ureteral ridge much enlarged, and at the point where the orifice should be there are numerous polypoid processes of mucous membrane, which wave to and fro in the vesical fluid. The ureteral opening cannot be seen, and no fluid is seen spurting from that side.

Ureter Catheterization. Casper's instrument introduced, and the right ureter catheterized with ease. The urine collected from it contains a few red blood corpuscles, but is otherwise normal. It is impossible to catheterize the left ureter, the orifice of which is hidden among the polypi described above. Although the catheter had been pushed among these in various directions the point fails to engage, and it is evident that a stricture is present.

NOTE.—The appearance of the left ureteral orifice made it evident that there is considerable disease of that ureter above, probably associated with renal lesions. Tubercle bacilli had not yet been demonstrated. Several X-ray pictures were taken, with negative results. Although the diagnosis was, therefore, inconclusive, the cystoscopic demonstration of left-sided ureteritis with stricture, taken along with the three years' history of intermittent attacks of pain in the region of the left kidney, was sufficient to render operative exploration advisable.

Operation. On October 1, 1902. The left ureter was exposed extraperitoneally through the lower half of Israel's incision. It was considerably enlarged (1 cm. thick), and its walls were thick and hard. This condition extended down to its juncture with the bladder, and up to the kidney. There was no calculus present. In order to explore the kidney the wound was enlarged upward. There was no thickening of the fatty capsule, but the

kidney was congested, enlarged, lobulated, and its lower pole focal areas of suppuration were present.

Complete nephro-ureterectomy was performed, the ureter being divided after ligature with catgut, in its juxtavesical portion.

The patient made a good recovery. The specimen showed miliary tuberculosis of the kidney, pelvis, and ureter.

CASE III. *Chronic sinus of the left side supposedly due to necrosis of the ribs; cystoscopic demonstration of atrophy of left side of trigone; contracture of orifice of ureter, and absence of urinary function; operation; kidney found destroyed by calculi; nephrectomy; cure.*—S. C. W., aged twenty-one years, male. Complaint, "running sore on back."

Family and past histories negative. No typhoid. No cough.

Present Illness. Patient says his mother tells him that at the age of four years he began to have attacks of pain in the left side, which were followed by considerable swelling there, but would gradually subside. From this time until sixteen years old these attacks came on at intervals varying from one to several months, and although the swelling was at times considerable and the skin looked red, "no abscess was found." Between attacks he would often have a dull, aching pain beneath the ribs and in the left lumbar region. In May, 1897, after an attack of dysentery, a severe "attack" came on and his physician found that an abscess had formed which required opening. A large amount of pus was evacuated. Since then a fistula has persisted at the site of incision, for which he has been operated upon twice, the diagnosis of necrosis of the rib having been made, but no good has resulted. During the past four years since the beginning of the fistula he has been free from the attacks of sharp pain, etc., but there has been a dull ache present in the region of the left sacro-iliac synchondrosis.

There have never been any urinary symptoms, with the exception of one month in 1891, when he suffered from incontinence of urine and vesical irritability. He says his urine has always been clear, and that he has never passed a calculus. He voids his urine at normal intervals and complains only of the persistence of the fistula, and the pain in the left sacral region. He has never had any form of paralysis. Since the abscess was opened nothing but a small amount of pus has escaped from the fistula.

Examination. Patient poorly nourished, anæmic, very nervous. Pulse rapid, but heart sounds normal. Lungs negative.

The right kidney is movable and larger than normal. The left kidney cannot be felt. There is no tenderness on deep palpation over it or along the course of the ureter.

Beneath the middle of the twelfth rib on the right side is a sinus, into which a probe passes upward and inward for 5 cm. There is no roughness elicited by the probe.

On rectal examination the prostate seemed normal in size; the seminal vesicles not palpable.

Urine clear, no shreds, acid, 1020, no albumin, no sugar; microscopically negative.

NOTE.—Although there was very little in the history to suggest renal diseases, cystoscopic examination was performed more from the desire to make the examination complete than from the hope of finding anything abnormal.

Cystoscopic Examination. The vesical mucosa is normal in appearance, but there is a marked difference in the two sides of the trigone and their respective ureters. On the right the trigonal muscles are about normal in size; large jets of urine are frequently ejected from the ureteral orifice, accompanied by active contraction of the muscles of the side of the trigone and the ureteral ridge above.

On the left side the edges (or boundaries) of the trigone cannot be seen; the ureteral orifice is much contracted, pin-point in size, flat with the surface, the lips being absent; there is no intermittent contraction of the muscles

of that side of the trigone or of the ureteral ridge to be seen, and no urine is coming from the ureter.

Remarks.—The contrast is so marked, the pictures of the two sides so different—the right ureter surrounded by hypertrophied muscles and secreting an abnormally large amount of urine; the left not functionating at all, its orifice and surrounding muscles atrophied—that a diagnosis of calculus of the left kidney with long-standing blocking of the ureter was at once made. The lumbar fistula was thus explained.

Several radiographs were then taken by Dr. Deetjen, and much to our satisfaction showed five shadows of varying size in the region of the left kidney.

On October 23, 1902, I removed the kidney by the lumbar route. The fistula was found to lead past the rib to the kidney, which was much smaller than normal, the cortex being almost entirely destroyed, merely forming a sac for the contained calculi. There was so much perirenal fibrous tissue that nephrectomy was extremely difficult, requiring preliminary resection of the twelfth rib. The ureter was completely blocked at its upper end; below that it was abnormally small, thin, and empty.

The patient made an uninterrupted recovery, and returned home well.

Case IV. *Calculus impacted in the intravesical orifice of the left ureter detected by the cystoscope and extracted by means of a ureteral catheter.*—S. B., aged thirty-one years, male. Admitted to the Johns Hopkins Hospital July 8, 1901. Complaint, kidney trouble.

Family History. Patient's mother is supposed to have died of stone in the bladder.

Past History. About seven years ago the patient, in good health at the time, was suddenly seized by a severe pain in the region of the left kidney. This lasted about an hour and was relieved by morphine. There were no other symptoms during the attack that the patient noticed. Six months later sudden and severe pains attacked the

patient in the left kidney, accompanied by vesical tenesmus, pain and frequent micturition, the desire not being relieved by passage of urine, and pain along the urethra, often definitely felt at the end of the penis. These symptoms persisted about a week, with more or less severity, and then gradually disappeared. Since then patient has had no decided attack, though at irregular intervals he was troubled by slight pain and discomfort in the left kidney.

Present Illness. During the first week in April, patient was seized with a severe pain in the left kidney, which continued for several hours and was only relieved by morphine. This was unaccompanied by other symptoms, but two days later the patient felt the pain about the neck of the bladder, and had a constant desire to micturate, the act giving him no relief. He also suffered from severe pain at the end of the penis. At times he urinated freely, but at others something seemed to keep the water from coming. Crises of pain usually occurred twice in the twenty-four hours. These symptoms have continued up to the present time, though the kidney pain has lessened while that about the neck of the bladder has increased, and he now has an almost constant pain in the end of the penis, and twice during the day he has had a colicky pain in the left side.

Examination. Patient a strong, well-nourished man; heart and lungs negative. Abdomen held tense, rendering palpation difficult. Liver, spleen, and kidneys are palpable. Genitalia: Left testicle is markedly retracted (of recent occurrence). Penis normal, but meatus quite small. Rectal examination: Prostate little enlarged, there is a distinct tenderness chiefly up in the median line, pressure causing great pain, and slight induration is felt at the tender point. A searcher passed into the bladder detected no definite stone, but a slight grating sensation was present. (This was followed by chill and pyrexia of 105°.)

On admission, the patient's urine was acid, 1018, no sugar, trace of albumin, white and red blood corpuscles, calcium oxalate crystals, no bacteria seen.

July 9, 1901. A meatotomy was done to allow more room for a subsequent cystoscopic examination.

Cystoscopic Examination. July 10, 1901. Detection of small calculus impacted in left ureteral orifice. Calculus dislodged by instrumentation with ureteral catheter and Casper's cystoscope.

The patient was prepared for an aseptic examination, and after careful irrigation of the bladder the Nitze cystoscope was introduced. The bladder was found to be normal. The prostate showed no intravesical hypertrophy. The right ureter was normal in appearance, functionating regularly, and the urine ejected was clear. In the region of the left ureteral orifice a small, irregular mass projected into the bladder cavity. At first it looked like a mass of fibrin, but after repeated washings of the bladder it was seen to be a dark, irregular calculus, which was caught in the mouth of the ureter. The surface of the calculus was very irregular and several small, sharp processes were seen. It appeared to be three or four times as large in diameter as the end of the ureteral catheter, though it was not spherical in form. It did not completely fill the ureteral orifice, and to one side there was a patency through which a fine stream of urine was ejected.

The ureteral ridge was considerably enlarged, apparently indicating that the ureter above was dilated. An attempt was now made to pass a ureteral catheter into the small opening left by the incomplete blocking of the calculus of the orifice, but in so doing the stone was pushed back into the ureter for a short distance, leaving a round, patulous ureteral orifice, with thickened edges. On withdrawing the catheter the stone followed it and again presented itself at the ureteral orifice, but there lodged. It was now decided to attempt to dislodge the

stone by lateral pressure with the end of the catheter—*i. e.*, to prize it out of the ureter if possible. The prism of the catheterizing cystoscope was, therefore, placed nearer the stone and the catheter made to lie in a direction at right angles to that of the ureter and with the tip of the catheter against the side of the calculus. Pressure was then made against the calculus by pushing the catheter, but the former was held so tight in the ureteral orifice that it only swayed to and fro under the force exerted on it, but was not dislodged. *After several exciting attempts, strong lateral pressure was obtained closer to its point of detention, and the calculus was finally prized out of the ureter and fell to the floor of the bladder* (see Fig. 8), *leaving a large round hole —the dilated ureteral orifice.* This manœuvre caused considerable hemorrhage from the ureter and the prostate, so clouding the fluid in the bladder that the cystoscope failed to locate the stone in the bladder. Bigelow's evacuator was now used without success, and the patient was returned to the ward, with instructions to preserve and filter all the urine he passed. Patient says that he was immediately relieved, by the cystoscopic instrumentation, of the pain which he had suffered, and has had none since. A slight chill and rise of temperature followed instrumentation.

11*th*. This morning about forty hours after the cystoscopic examination, the calculus was passed during urination. It is of a dark brownish-black color and about 6 mm. in diameter and 3 mm. thick, the surface is rough, with sharp, irregular processes and spicules. There was no pain produced by its passage through the urethra, and, in fact, the patient was not aware that it had escaped until it was found in urine voided. The patient says that he has had no return of pain in bladder, penis, or kidney since the cystoscopy.

12*th*. Patient has for five days suffered with pyrexia, which began with a chill following searching the bladder for calculus two days before cystoscopy. To-day a definite

epididymitis is present. There is no pain in the bladder or kidney.

17*th*. Patient is still free from pain, except that in the epididymis, which is now very slight. The urine is slightly cloudy and contains cocci and bacilli, but no red blood corpuscles.

Cystoscopic examination shows a slight acute cystitis. The orifice of the left ureter is still large and gaping, but smaller than before. No stone is present. Patient discharged.

March, 1901. Patient returns for examination; says he has had no return of renal colic. Examination with cystoscope shows the left ureter much smaller than when last seen. No calculus present.

CASE V. *Calculus impacted in left ureter for probably twenty-seven years; removal by extraperitoneal ureterolithotomy through an iliac incision; lateral cystotomy and intravesical ureterotomy for stricture of the intramural ureter; cured.*—W. B., aged twenty-nine years, married. On August 28, 1901, consulted me for bladder and kidney trouble.

Personal History. Had gonorrhœa eleven years ago, a fairly mild attack, but accompanied with epididymitis. He thinks he was completely cured. Has never had any serious illnesses.

Present Illness. Ever since childhood has had more or less constant pain in the region of bladder and left kidney. Patient thinks this began when he was about two years of age, and has never been entirely free from it during these twenty-seven years. There has generally been a dull, aching pain more or less constantly in the region of the bladder, and a sore feeling in the region of the left kidney. At intervals of two weeks or more he has had attacks of pain of great severity located in the neck of the bladder and radiating from there along the urethra to the glans. At times the pain is also severe in the left lumbar region. There has never been a retraction of the

testicle. These attacks often come on suddenly and last for two or three days; they are always accompanied by hæmaturia and never by frequency of urination.

The attacks as outlined above have continued up to the present time. He has now a dull, aching pain in the region of his bladder, and the soreness extends up to the left kidney. These symptoms are sufficient to give him considerable discomfort all the time. He has no sharp attacks of colic, and micturition is apparently perfectly normal.

Examination. Patient is a well-nourished man. Lips of good color, heart and lungs negative. Abdominal examination negative, no tenderness in the region of the left kidney, nor along the urethra. Genitalia normal, no urethral discharge, urine clear, no shreds, very acid in reaction, microscopically negative. Prostate per rectum somewhat enlarged; there is a nodule in the region of the ejaculatory duct; nothing abnormal felt above the prostate, and no tenderness.

September 3, 1901. Urine to-day is slightly reddish in color, and under microscope red blood corpuscles are found.

4*th. Cystoscopic Examination.* Catheterizing of ureters, discovery of a stricture of the left ureter.

The mucous membrane was everywhere normal except in the region of the left ureter. The end of the left ureter was located in a considerable ridge, which ran in the direction of the ureter down into the trigone. The ridge was much larger than normal and just to the outside of the mouth of the ureter, which was round in shape and much smaller than normal, there was a deep depression in this ridge.

To the outside and back of this the ureteral ridge projected far into the bladder almost as a septum, on each side of which was a fairly deep pouch, around which the bladder wall was considerably trabeculated. The mucosa along this ridge and especially in the region of the ureter was very red in color, and much rougher than normal. The

right ureter and region around it was normal in appearance. The Casper ureter cystoscope was then introduced and the catheter inserted into the mouth of the left ureter. Almost immediately the mucous membrane of the ureteral opening became invaginated, and seemed to be drawn along by the catheter, which would only pass for a short distance (about 1 cm.). Several attempts were made to introduce the catheter farther, but without success, and no urine was obtained from it. The conclusions reached in regard to the left ureter were as follows: The lower end was strictured. The ureter just above it (the intramural portion) was much dilated, producing the bulging of the bladder wall over it, in which a stone probably lay.

The right ureter was normal in appearance and the catheter entered easily, but would only proceed for a distance of about an inch and a half, when the same invagination occurred (probably owing to a lesser congenital narrowing). A small amount of urine was obtained from this ureter, showing nothing abnormal except a few red corpuscles, which were thought to be due to traumatism.

15*th*. X-ray photograph taken by Dr. Deetjen shows a distinct shadow of a calculus in the region of the left ureter, and about its junction with the bladder. The shadow is 2 cm. long by 1.5 cm. wide, and oval in shape. It is seen just to the side of the shadow of the coccyx, about 2 cm. from the median line of the pelvis, 3 cm. from the shadow of the ischium, and about 2 cm. in front of the shadow of the posterior wall of the pelvis. There is no other stone to be seen.

Another plate taken higher up shows a larger shadow for the left kidney than for the right, but no calculus.

An X-ray plate taken by Dr. Sampson, of the Johns Hopkins Hospital, shows a calculus of the same size, and in the same location in the pelvis, as described above. The shadow here is seen about 3 cm. to the outside of the median line opposite to the tip of the coccyx.

October 15*th*. The patient has been under observation

for six weeks. During this time he has had an almost constant dull, aching pain in the left kidney, and a pain of a little greater severity, which he says is deep-seated and apparently located back of the symphysis pubis, and from there at times extends along the neck of the bladder to the end of the penis. Micturition has no effect upon these pains, and is of normal frequency. During this time blood was at times present and at others absent. On September 13th the hæmaturia was considerable. When free from blood the urine contained no albumin.

16*th*. *Operation* (Young). Ether; extraperitoneal ureterolithotomy; extraction of a stone from the juxtavesical ureter through an incision above the pelvic brim; ureteral wound closed; lateral cystotomy; intravesical ureterotomy, for stricture of intramural ureter. The abdominal incision, seven inches long, was made from a point about the middle of Poupart's ligament, upward and outward, passing about an inch from the spine of the ilium. As soon as the peritoneum was reached it was elevated by the fingers, and the stripping process carried rapidly downward over the iliacus and psoas magnus muscle and the iliac vessels easily exposed. Search was then made for the ureter, bearing in mind the fact that it was generally to be found adherent to the elevated peritoneum. The peritoneum was found very much thickened, and the tissue greatly changed by fibrous hyperplasia. Nothing simulating the normal ureter could be found, and in the place where it should be, a large coil of about the size of a small intestine was found. On account of its great size and because it seemed to be intraperitoneal, this was not supposed to be the ureter, until after the wound had been carried upward and outward, exposing the kidney. The pelvis was found greatly dilated, and coming from it a very greatly dilated ureter was found, and proved to be that which was before supposed to be the intestine. The ureter was one inch in diameter and considerably convoluted. It was separated

from the peritoneum to its junction with the bladder, at which point a stone was felt (see Fig. 9), and after some little pressure against its deepest end with the finger, it was dislodged and gradually pushed upward in the ureter until it reached a point about five inches from its lower end. Drawing the ureter taut around it and using the stone as a bobbin (see Fig. 10), two mattress sutures of fine silk were placed in the ureter over the stone. An incision was then made and the stone removed. It proved to be a calculus 2 cm. long, $1\frac{1}{2}$ cm. wide, and $1\frac{1}{4}$ cm. thick. It was very hard and generally smooth, and showed broad grooves which had been worn away by the urine. The stone is apparently composed of alternating layers of urates and oxalates. After removing the stone from the ureter, a metal probe was inserted and search was made for other stones upward and downward in the ureter, but none were found. Attempt was then made to pass probes, catheters, and the ureteral dilating instrument devised by Dr. Kelly, through the lower end of the ureter into the bladder, but without success.

Operation for the Stricture. The points of small instruments apparently engaged in its lower end, but would not pass into the bladder. Remembering the fact that it was impossible to pass a ureteral catheter for more than a short distance into the ureter during the previous cystoscopic examination, it was decided to make an opening into the bladder, and then dilate or incise the stricture from within the bladder. Another reason for dilating this stricture was, that it was found impossible by squeezing and milking the ureter to force the urine, with which the part below the incision was distended, into the bladder and thus empty it. It was thought best to make an incision into the bladder along its left side, rather than to make a new suprapubic opening through the abdomen. In order to do this it was necessary to dissect the vas deferens from the bladder, and to push it downward so as to make an incision above it into the bladder. (Fig. 11.)

After the opening had been made, the fluid evacuated and the bladder dried. Several attempts were made to pass a probe into the ureter from below, but it was found impossible to go more than 1 cm. Working with the small bulbous dilator of Kelly through the ureter from above, and with a finger making a counter-pressure in the bladder covering the end of the ureter, it was finally possible to push the small end of the dilator through the stricture until it appeared in the bladder. (Fig. 12.) Palpation with the finger then showed a distinct hard ring about 1 cm. distant from the orifice of the ureter, and completely encircling its calibre, and of such strength as to prevent one from pushing the bulbous part of the dilator through. The calibre of the stricture was apparently about 3 mm., and the thickness of the ring about 4 mm. The very smallest Kelly dilator was next tried, but with the same result—*i. e.*, the instrument would pass until the bulbous enlargement came against the stricture and its point appeared in the bladder, but would go no farther. *It was then decided to divide the stricture with a knife, and an incision was accordingly made along the dilator through the mucous membrane of the bladder into the stricture, until it was divided, and the instrument could pass freely into the bladder.* The incision required was probably 1 cm. long, and had to be made while keeping the knife against the dilator in the ureter. (Figs. 12 and 13.)

The largest dilators and catheters were then easily passed into the bladder through the ureter from above. The incision in the bladder was closed by eight mattress sutures of fine silk, the edges of the wound being inverted. The ureter was also closed with three mattress sutures of fine silk. Two small gauze drains were inserted to provide for possible leakage of the sutured ureter and bladder. The muscles and fasciæ were closed with mattress sutures of silver wire, and the skin closed with subcutaneous silver.

November 6th. Patient's condition excellent since

operation. The urine, which was at first bloody, is now almost clear. The wound was dressed to-day and a portion of the gauze drain removed, and the subcutaneous silver sutures taken out of the suture wound. Wound healing *per primam.*

13*th.* The remainder of the drain was removed; there has been no suppuration, and at no time any leakage of urine from either the ureteral or vesical wounds.

21*st.* Abdominal wound has healed completely; patient is in excellent condition. Discharged from the hospital. He is apparently perfectly relieved.

March 7, 1902. Patient says that he has been in splendid health, has had no pain at all in the region of the bladder, ureter, or kidney, and urination is of normal frequency; his urine has been perfectly clear, and he has gained about twenty pounds in weight. Left kidney and ureter not palpable nor tender. On rectal examination a small mass is felt above the seminal vesicle (probably the cicatrix of the ureteral operation). Prostate still somewhat indurated. Urine is perfectly clear and normal.

Cystoscopic Examination. Bladder healthy, right ureter apparently normal and functionating frequently. The left ureteral orifice is in the shape of a crescent, with concavity about three times as long as normal. At the outer end of the crescent a small aperture is to be seen, through which the urine comes. The usual peristaltic wave is not to be seen, but a fairly forcible jet of urine separates the edges of the outer part of the orifice. In the inner two-thirds the lips of the orifice are approximated and are not separated by the outflowing urine. The cystotomy wound in the left side of the bladder cannot be seen.

December 1*st.* Patient in perfect health. Urine normal.

Case VI. *Calculus impacted in juxtavesical portion of the right ureter; demonstration by ureteral catheter and radiograph; ureterolithotomy; suture; cure.*—W. W. M., male, aged twenty-five years, was admitted August 28, 1902.

Complaint, "stone in right kidney." Family and past histories negative. No typhoid.

Present Illness. Five years ago the patient was taken with a severe pain in the right side beneath the ribs, which lasted for six hours, and required morphine. One week later a second attack, similar to the first, came on, and again, after a week's intermission, the third attack. In all three the pain remained localized to the right side and back, and was not associated with hæmaturia or vesical irritability.

In December, 1900, after a respite of three years, he had an attack of pain which began in the right testicle, but soon travelled from there up to the kidney. After that four similar attacks occurred, about one month apart, the last being associated with hæmaturia, and followed by the passage of a small calculus. He was then free from pain until September, 1901, since which time he has had attacks at intervals of one to three weeks up to the present time. "The pain always begins in the right testicle and ends in the kidney." He has not passed a second calculus; there has been no urinary disturbance, no blood. Between attacks he has felt well, with the exception of a dull pain which is located deep down in the pelvis ("in the region of the bladder"), and is sometimes more severe after micturition. No pain in the end of the penis.

Examination. The patient is pale and extremely neurotic. Chest and abdomen negative. Palpation of the abdomen is difficult, but there is no tenderness over the kidney or along the ureter. Rectal examination reveals nothing abnormal. Urine: clear, acid, 1020, no albumin, no sugar. A few shreds are present, which are found to be composed of pus cells; no bacteria present.

Cystoscopic Examination. The plain Nitze instrument showed a normal bladder. The ureters were both functionating, the fluid coming from each clear, and nothing present to indicate disease higher up on either side. Casper's catheter cystoscope was then introduced

and the right urether catheterized. After the catheter had passed upward for a distance of about 4 cm., an impassable obstruction was encountered. Although considerable force was used the catheter would proceed no farther, but doubled on itself. To our surprise, however, we found that urine was flowing intermittently from the catheter, so that it was not withdrawn but held carefully in place until the quantity sufficient for examination was obtained.

Urinalysis of this specimen showed much more urea per 1 c.c. than that of the voided urine. There were no pus cells present, but numerous pear-shaped epithelial cells were seen.

The diagnosis of calculus of the juxtavesical ureter was made, and patient was sent to Dr. Deetjen for X-ray photographs.

Radiographs. Several excellent radiographs were obtained. These showed nothing in the region of the kidney; but in the right side of the pelvis, corresponding to a point in the ureter about 2 cm. above the bladder, a small oblong shadow was shown (about 1 x 1½ cm. in size). In order to determine accurately its distance above the bladder, I injected into the bladder 80 c.c. of a heavy suspension of bismuth in water, and then had Dr. Deetjen take another photograph. This showed a large transverse oval shadow (the bladder) and just above it the small shadow, the calculus. [This method should prove of value, in the absence of the cystoscope, to determine whether a calculus were situated in the bladder or above it.]

September 10, 1902. Urine voided in past twenty-four hours, 710 c.c. Total amount of urea, 18.5 grammes.

11*th.* Total urine, 2200 c.c. Total urea, 20.5 grammes. The patient is in excellent condition. The urine is not infected. Operation advised (extraperitoneal ureterolithotomy) and agreed to.

12*th.* *Operation.* (Young.) Ether; extraperitoneal

ureterolithotomy; dilatation of the ureteral stricture; closure of ureter with sutures. An incision corresponding to the lower half of Israel's incision was made, the peritoneum stripped up from the iliac muscles and vessels, and the ureter found incorporated in the elevated peritoneum. As in the other case (V.), it did not lie plainly visible on the posterior surface of the peritoneum, but, instead, was almost surrounded by the latter, to which it was so intimately adherent that only by palpation between the thumb and finger was the thickened tube felt and finally freed from its peritoneal bed. The ureter was 1 cm. in diameter, its walls thickened and somewhat congested. After it was once discovered and freed it was an easy matter to follow it down its intrapelvic course, and there, at a point 1½ cm. above its juncture with the posterior surface of the bladder, a calculus was felt tightly impacted in its lumen, and surrounded by considerable extraureteral scar-tissue. The stone, which was about 8 x 14 mm. in size, was dislodged with the finger from its incarceration and "milked" upward until a point in the ureter above the pelvic brim was reached. Using the calculus as a bobbin, the sutures were put in before the ureter was opened, as in Case V. (Fig. 11.)

After extraction of the calculus, small bougies passed down the ureter detected a stricture just below the site of the calculus. After considerable manipulation a very small bougie was passed through the stricture, and followed by successively larger ones, until the calibre was larger than normal.

After exploring the higher ureter and renal pelvis with a probe, and finding no stone, the previously placed sutures were tied, thus tightly closing the ureteral wound.

The abdomen was closed as usual, a small drain leading to the ureteral incision having been provided.

The patient made a rapid recovery. The gauze drain was removed on the tenth day. There was no leakage of urine.

January, 1903. The patient has completely regained his strength and health. He is entirely free from the dull pain which he had before operation. Urine normal.

CASE VII. *Hæmaturia of four years' duration; no pain; detection by cystoscope of a large pedunculated tumor of bladder, involving region of the right ureter; complete extirpation by suprapubic cystotomy; cure.*—J. D., aged sixty-five years, male. Admitted August 5, 1902. Complaint, "hæmaturia."

Family History. Negative.

Past History. Patient says he always had a tendency to bleed from small cuts more abundantly than other people. Had numerous and prolonged attacks of epistaxis up to six years ago. A brother suffered similarly, but no other member of the family did. No previous history of urinary disturbances. No history of intravesical instrumentation, of traumatism, or of calculus.

Present Illness. About four years ago the patient first noticed that his urine contained blood. He had no abdominal symptoms, no pain, no urinary disturbance, and thought the blood came from exposure to cold. In a short time it disappeared, but the urine was cloudy, and has been so ever since. About one year ago red blood again appeared in his urine, but only lasted during one day and he was otherwise symptomless. Since then he has had four similar attacks, the last one being ten days ago, when the amount of blood was greater than ever before. He thinks that two voidings must have contained together one pint of blood; but after that there was no more bleeding. With the exception of the cloudy urine and intermittent hæmaturia, he has noticed nothing abnormal, with the exception of a slight increase in frequency of urination of late. He has not had to get up at night to urinate; the stream of urine is large, never any sudden stoppage; has no discomfort before, during, or after urination, except at times a burning in the urethra. He has often suffered with pain in the back, but there has been

no symptom indicating disease of either kidney. The urine, as stated above, has been cloudy since the first attack of hæmaturia. During these the blood is usually well mixed with the urine, but sometimes clots are passed. There is never any bleeding from the urethra between urinations. He has not had chills or fevers, has passed no calculus, and has lost but ten pounds in weight. General health fairly good.

Examination. The patient is well nourished, the mucous membranes of good color. Pulse 60 to the minute, vessel wall moderately thickened. Lungs normal. Heart: Slight systolic murmur present at apex; other sounds clear. Abdomen negative, with exception of slight tenderness in the lower left quadrant of the umbilical region. Neither kidney palpable nor tender.

Urinalysis. Slightly smoky, acid, 1021. Albumin considerable, no sugar. Microscopically, many pus cells, moderate number of red blood corpuscles, no casts. Specimen of freshly stained urine shows numerous long and short bacilli.

Rectal Examination: Prostate slightly enlarged and indurated, surface smooth; rectal mucosa not adherent.

Cystoscopic Examination: A catheter passed easily, and very little residual urine was found, but hemorrhage was at once produced, and after numerous irrigations the fluid still came away cloudy with blood. The cystoscopic examination was, therefore, unsatisfactory, but it was enough to determine that a large intravesical tumor was present, though the region of the bladder from which it sprang could not be made out. The patient was advised to submit to an exploratory suprapubic incision, but preferred to await developments.

Second Admission: In February, 1902, the patient returned for operation. He reported that his urine had been free from blood during the fall, but that the hæmaturia had returned later, and at times the loss of blood was considerable. Micturition had also become more frequent,

but there was difficulty in voiding. Recently the urine had been clear. On examination the patient was found to have lost weight, and was paler than before. The urine was much clearer than before, and contained no blood; pus cells and bacteria present in moderate number. Prostate as before.

Cystoscopic Examination. No hemorrhage was produced by the catheter and a clear view was easily obtained. A large globular tumor was seen springing from the region of the right ureteral orifice by a broad pedicle. The surface of the tumor was rough, in places fissured, but not villous in type. No ulcerated areas were to be seen. The pedicle covered completely the orifice of the right ureter, preventing its detection. No urine was seen coming from that region. The adjacent bladder wall looked healthy. The left ureter was functionating actively, and its orifice normal in appearance.

Operation (Young). Ether; suprapubic cystotomy; excision of tumor; partial closure of bladder and abdominal muscles; drainage. A long skin incision was made in the median line, the bladder opened, tumor located and found to be about 5 cm. in diameter, globular in shape, with a short pedicle about 2 cm. thick, springing from the region about the right ureteral orifice.

In order to obtain good exposure the peritoneum was stripped back from the vertex and upper portion of the posterior wall of the bladder. In accomplishing this it was necessary to divide the urachus. [I have frequently employed this procedure and found that it affords at once a splendid view of the interior of the bladder through the long incision, which can be made after the peritoneum is stripped back. This procedure obviates entirely the necessity of the transverse abdominal incision, or symphysiotomy and other bone plastic methods, which have been advocated as necessary for adequate exposure of the interior of the bladder.]

With the abdominal retractors placed so as to include

the bladder wall on each side, the pedicle of the tumor was within easy reach, and a long, curved clamp was placed across it. As this clamp happened not to be close enough to the bladder wall, traction was made by means of it, and a second clamp was slipped on beneath it. [By taking successive "lower holds," a clamp may be placed very high up at the base of the pedicle.]

Not wishing to ligate the pedicle on account of its relation to the ureter, we cut across it with a Paquelin cautery, the blade of which was kept in close contact with the under surface of the pedicle clamp. When the division was complete the bladder wall at once retracted, showing a depressed denuded area about 2 x 3 cm. in size, in which the ureter opened and in which two or three small bleeding arteries were seen, clamped and ligated with catgut. Complete hæmostasis was thus obtained.

The remainder of the operation consisted in closing the bladder and the abdomen (partially) with catgut, and providing intravesical gauze and tube drainage.

The patient stood the operation well. The convalescence was interrupted by a breaking down of the sutured muscular wound, but the patient ultimately made a good recovery. Cystoscopic examination, six months later, showed a practically normal bladder. The scar of operation could hardly be seen, and the orifice of the right ureter, which lay in it, was large and functionating well. The patient had regained his health completely. One year later he is still well.

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DISCUSSION.

Dr. C. H. Mayo, of Rochester, Minn.—I am rather surprised that you should call upon a general surgeon to make remarks on this subject, which belongs to genito-urinary surgery, but I can only explain it on the ground that a general surgeon would be less prejudiced in having any special method to advocate.

I am sure, we are all indebted to Dr. Young for his admirable paper. We have not had very much of this work to do in the Northwest. I only recall three cases, one of which was exactly like the case which Dr. Young described. In this case there was a stone in the ureter adjacent to the bladder, and the case was operated on intraperitoneally. In the beginning, the case was thought to be one of appendicitis. On opening the abdomen, the ureter, which was enormously dilated, ran over the brim of the pelvis, it being about five-eighths of an inch in diameter. It was cystic, and by following it down a stone was found in the ureter near the bladder. It was removed without opening the bladder, and a small drain, which proved to be unnecessary, was introduced at the point of incision in the ureter.

The other two cases were operated on extraperitoneally. In

one, the stone was situated at the brim of the pelvis, where the ureter crosses the iliac vein; in the other, the stone had just entered the ureter from the pelvis of the kidney.

In the examination of these cases I was sorry the essayist did not go into the details with reference to the use of the catheter. There is a difference of opinion about the dangers of the use of the ureteral catheter at this time. In the presence of pus in the bladder and of so-called infection of one kidney, we know that the infection is limited to one kidney and cannot be found in the other. Furthermore, we know that a bladder which is badly infected will not infect either kidney, so that there must be a remarkable anatomical valvular structure where the ureter opens into the bladder, possibly more delicate than we can determine. We have to use the ureteral catheter to some extent for the purpose of diagnosis. We do not make use of this catheter. By the ordinary means, the Harris segregator, the cystoscope, the use of the X-ray, and symptomatology, we can make a sufficiently accurate diagnosis to indicate operation. Personally, I feel that if I had any trouble with my own bladder and kidneys, I would not permit the use of the ureteral catheter.

Dr. Charles P. Noble, of Philadelphia.—I rise to add two cases to Dr. Young's list. The first one was an extraperitoneal operation for stone in the ureter, just below the iliac vein, in a man. The symptomatic diagnosis was stone in the kidney. The X-ray showed a stone just below the brim of the pelvis. It was a beautiful illustration of the value of the X-ray, because without the skiagraph I should undoubtedly have cut down on to the kidney, and not have suspected the location of the stone until after we had failed to find it in the kidney. While the operation was difficult technically, it was satisfactory, in that the patient recovered. When I reached the stone, it was about half an inch below the brim of the pelvis. I tried to dislodge it upward, so that I could sew up the incision more easily, but the stone was so irregular that it could not be dislodged. I did not use the method which has been suggested by Dr. Young, as I was afraid of sloughing of the ureter. I therefore incised and sutured the ureter *in situ*. The patient made a good recovery. This case was reported recently in a series of cases of ureteral surgery.

The other case is an old one, but is interesting on account of the bearing that it has on what is now well recognized,

namely, that a good many cases of encysted calculus of the bladder are really cases of ureteral calculus in the intravesical portion. In that case I supposed I had a tumor of the bladder, and made a suprapubic cystotomy, and not until my finger was in the bladder did I suspect a stone. Putting a tenaculum into the mass, I could easily detect the grating, and the operation consisted simply in incising over the stone and removing it.

The other point which I might touch on was the one raised by Dr. Mayo, in regard to catheterizing the ureters. I have had considerable experience in catheterizing the ureters, and first let me say a word or two from the standpoint of infection. In none of the cases that I have catheterized has there been any infection. We are always guided by our own experience. I do not think there is any practitioner who would be so foolish as to catheterize the ureters in a case in which the bladder was badly infected. I am sure, none of us would care to have a catheter passed through our own bladders if they were badly infected; therefore, we should not pass the catheter in a case of infection in any other individual.

I have to report one case in which I punctured the ureter, and that would not be possible without the stylet. It was a case in which I resorted to the Kelly method of catheterization, and a part of that method is to have the stylet in the catheter and pass the catheter up until it binds, then you remove the stylet half an inch or more, then pass the catheter on again. There is inherent in that method the possibility of poking the end of the stylet through the ureter. That happened in this case. With the catheterizing cystoscope, where there is no stylet, I do not see how it would be possible for this accident to happen. With the best methods I think the danger of wounding the ureter is very small.

Dr. J. Wesley Bovée, of Washington, D. C.—I thoroughly agree with the position taken by Dr. Young as to the relative merits of the different routes for reaching the ureter, particularly as regards surgical work upon the lower portion of it —that is, the extraperitoneal route. In the male the extraperitoneal route is better. In the female, for the lower two inches of the ureter, the best operation is through the vaginal wall. Probably, where a complete ureterectomy has to be done, the plan I have adopted, and one I carried out last week, was to first make an incision through the vagina, ligate the

ureter close to the bladder, loosen the ureter from the broad ligament, go in from above, and remove the kidney and ureter. I have removed the kidney and ureter *in toto* from above, but it is a difficult operation. If you have to place a ligature on the ureter when it is much thickened, you can do it much better through the vaginal wall than through a loin incision. These points the essayist has mentioned are of great interest, namely, the points of narrowing and the methods of examining for stone. My attention was directed to that stone detected there (referring to diagram), in which it was close to the wall of the bladder in the male. Although I have never found it in the male in that location, I believe that a bimanual examination should have detected it, with the finger in the rectum and the opposite hand on the abdominal wall. I do not know whether Dr. Young used that method in examining his cases or not.

I have the same objection to the use of the ureteral catheter that Dr. Mayo has, namely, of going through a bladder that is infected into an apparently healthy ureter. For instance, let us suppose one has pus coming out of one ureter, and has evidence, upon bimanual examination and by the symptomatology, that there is disease on one side, one kidney and one ureter being involved. There is an inflamed mucous membrane of the bladder, and one wants to know the condition of the other side. I object to the use of the ureteral catheter under such conditions. I prefer the use of the Harris segregator in such cases; otherwise I am afraid of carrying infection by the ureteral catheter to a healthy ureter on the other side. We have to make some allowance for contamination of the side of the bladder into which normal urine is coming.

As to the other operations, Dr. Young probably did not have time to touch upon such work as is necessary from injuries to the ureter where it is cut off during hysterectomies. This, as well as tying ureters in operations for cancer of the uterus done by the vaginal and abdominal routes, are common injuries. I believe that injuries of the ureters or the severing of them in this region following these operations are much more common by the vaginal than by the abdominal route.

Dr. Alexander Hugh Ferguson, of Chicago.—I wish to congratulate Dr. Young on his excellent contribution. The surgery of this part of the urinary tract is very difficult, and anyone who makes advances in it does a great deal of good to surgery.

As an aid to diagnosis, I have frequently used a sound in the bladder, with finger in the rectum, and made a gentle sweep along the pelvis (not original). In removing a stone from the kidney and upper portion of the ureter, *I have passed air into the bladder* (ballooned it), and thus found out that the ureter was patulous. A year ago I presented a drawing before the American Medical Association where the ureter was full of stones from one end to the other. I completely extirpated it from the bladder, the kidney having been destroyed by a stone and suppuration before that. In one case of stone in the lower end of the ureter that came under my observation recently, I went in extraperitoneally, passed my hand down, and squeezed the stone into the bladder, or, rather, forcibly pushed it into the bladder. That can be done in some cases. It is the only case I have had of stone at the vesical end, with the exception of the case where I removed the entire ureter.

The X-ray is unreliable in these cases. Dr. Ochsner reports a case where the X-ray was used, and showed a stone apparently in the ureter, but when he cut down he found it to be a calcareous lymphatic gland. A week ago I cut down on to a ureter, a stone having been shown by the X-ray, but I was unable to find one there, but did find a stone in the kidney. The X-ray was unreliable in this case.

With reference to ureteral catheterization, I think it ought to be avoided as much as possible. With the cystoscope we can see pus and urine coming from the ureter on the diseased side, and this, with the other indications, are sufficient without catheterizing the opposite ureter.

The Harris segregator cannot always be relied on. I recall one case in which I removed the right kidney for tuberculosis, also the ureter on that side. I introduced the Harris segregator which showed urine as if escaping from the side I removed the kidney.

Dr. Young (closing).—I shall not attempt to answer all of the points that have been brought out in the discussion, for the reason that many of them are incorporated in my paper, all of which I did not read, owing to the limited time at my disposal.

In regard to the ureteral catheter, in all of these cases which I have reported, with the exception of one stone case, there was no infection whatever in the urine. The urine, although it contained pus, contained no organisms, so that the ureteral

catheter was not contraindicated if the operator's technique was clean. In my fairly considerable experience in catheterization of the ureters I have found that there is practically no danger of kidney infection. I have had no case of kidney infection from it, and only one or two cases where the bladder showed the presence of a few organisms in it afterward, and these disappeared after one or two irrigations and the use of urotropin. I do not use the ureteral catheter upon the presumably sound side in cases where the bladder and opposite kidney are considerably infected. But if you thoroughly wash out the bladder, and in catheterizing the sound side, do not go too far (only an inch or two) you will not infect it, even when the bladder is infected. That has been proven by Casper and others.

I have used the segregator a few times. It is necessary to use a plain cystoscope before we use the segregator. Without ordinary cystoscopy one is absolutely unable to say that the bladder is not furnishing pus, blood, etc., things which may come from either side of the segregator. I had a case with an ulcer on one side of the bladder shown by the cystoscope. I used the segregator, and got blood from that side. One would have thought it came from the kidney had he not performed cystoscopy first.

In regard to what has been said about the other kidney, I will say that I seldom attempt any extensive operation on one kidney without being absolutely certain that the second kidney is doing good work. For this purpose the phloridzine test, the determination of the urea, and cryoscopy are of much assistance.

As to the point made by Dr. Bovée, I cannot speak authoritatively, but I am struck with the fact that so great a man as Israel has found it necessary in four out of six cases of calculus in the lower end of the ureter in the female, to use the extraperitoneal route. Twice he attempted to remove it by the vagina, but in both instances failed and had to resort to the extraperitoneal route. I believe that for calculus of that portion of the ureter which is immediately above the vagina (the intramural or juxtavesical portion), the vaginal route is all right, but that it is not so good for the higher locations.

The remarks of Dr. Ferguson and Dr. Noble were interesting to me, and I wish to thank them for the addition of their valuable cases.

PERSONAL EXPERIENCE WITH McGRAW'S METHOD OF GASTRO-ENTEROSTOMY.

By Samuel Lloyd, M.D.,
New York City.

In the *New York Medical Journal*, July 26, 1901, p. 133, Dr. Theodore A. McGraw, of Detroit, Michigan, published an article on gastro-enterostomy by means of an elastic ligature, which was exceedingly interesting. He said that in 1889, 1890, and 1891 he was interested in the study of the various methods of making intestinal anastomosis, and while experimenting on these he hit upon a method of performing it which was unequalled in the rapidity of its execution, its efficiency, and its safety, although it did not accomplish its purpose until after the lapse of two or three days. While this was Dr. McGraw's opinion at the time of the publication of his paper, in January, 1901, his son informed me in the summer of 1901—when he was a student at the College of Physicians and Surgeons of New York, and was present at one of my operations at the Post-Graduate Hospital—that his father had ascertained that fifty-six hours were sufficient to provide a free opening, and that consequently it was possible to begin feeding after this period had elapsed. Dr. McGraw gave up this method of operating because of the introduction of the Murphy button, and for several years did not give any further time to the investigation of the elastic ligature.

In his original paper he says that a number of other surgeons—notably Gaston, of Atlanta, in 1884, and Franz Bardenhauer, in 1888—had made similar investigations.

The former's work was confined to using the elastic ligature as a means of securing choleduodenostomy. No practical result was obtained, however, by these investigations, as the elastic ligature was not found suitable in making the anastomosis between the gall-bladder and the intestine, because the thinness of the walls of the gall-bladder allowed the ligature to cut its way through before there was sufficient agglutination between the viscus and the intestine. Bardenhauer tried to use rubber ligatures joined together in loops like a chain, every loop containing one centimetre and a half of tissue. This was found to be difficult of application and tedious. It had the disadvantage of making numerous openings in the viscera and multiplying whatever danger there might be from infection.

McGraw's first operation on the human body was made January 8, 1891, and published in the Journal of the American Medical Association, May 16, 1891. During his experimental work he made use of three kinds of ligatures: First, a large round rubber cord, four millimetres in diameter, which was speedily discarded; it was too large, clumsy to tie, and when tied took up too much room and tore too large a hole through the intestinal wall. Second, he tried a flat rubber band, three millimetres in width; this was serviceable, and can be advantageously employed if the third variety cannot be obtained. Third, and the method advocated, is a rubber cord, two millimetres in diameter, similar to the one that was formerly employed in the elastic ligature for operations upon hemorrhoids. This was preferred on account of its smoothness, elasticity, and great tenacity. When utilizing this material, one end of the rubber was shaved thin, so that it might be drawn through the eye of a so-called worsted needle. The advantage of this was that it made a small hole through the intestinal wall. By stretching the rubber during the passage through the walls of the intestine and stomach, and rendering it thin and small, it was easily drawn after the needle, and the subsequent contraction was found to more than fill

the orifice made through the viscus. He says that in most cases it was found preferable to pass the ligature through the gut in the direction of its long axis and at a point most distant from the mesenteric attachment. Before passing the ligature, the bowels were stitched together by three to six Lembert stitches; and after the ligature had been passed and tied, similar stitches were passed above the ligature—not only to give additional protection, but also to bury the rubber in intestinal folds. One inch or more was included in the ligature. The ligature was then tied in a square knot. This will usually hold, but, as it is desired to cut the ends very short, in order to cause as little peritoneal irritation as possible, a silk ligature was laid across the axis of the rubber ligature over which the first knot of the rubber was made. The silk was then tied over the rubber ligature while it was held taut, and a second turn of the rubber ligature made, and also held taut, the silk again being tied over the completed rubber knot. This tying of the rubber ligature draws the intestine together in folds, and apprehension was felt lest these folds, becoming agglutinated together, might be held in permanent corrugation. In this he was agreeably disappointed. Examination of the operative field, even after twenty-four hours, and before the ligature had made any appreciable progress in cutting through, showed that these folds were already in process of obliteration—in some way the intestine accommodated itself to the new conditions and became speedily smooth and shapely.

Another danger that he apprehended was that the ligation and folding of the intestinal wall might cause irritation, or even obstruction, of the gut. He said that when we consider the severity of the symptoms produced by the pinching of even small segments of gut in strangulated hernia, we might reasonably expect the occurrence of similar phenomena with the extreme pinching of two adjacent intestines held together by a tightly drawn rubber ligature. This never happened. Obstruction occurred in one or two

cases from too acute bending of an intestine, but ligation itself seemed in no wise to cause distress. Even in gastro-enterostomy, where the involvement of the stomach in the ligature might warrant the fear of an uncontrollable gastric irritation, this did not occur. It was evident that mere pinching or constriction of portions of the intestinal wall would not of itself cause great irritation, provided that the nutrition of the gut was not seriously interfered with. The symptoms following the operation seemed in no case to depend upon injury done to the intestine. If the wound ran an aseptic course the animal showed no distress, and in no case was there escape of feces or intestinal contents into the peritoneal cavity.

He reported the operation upon five patients. Two died in collapse, and were apparently far advanced in disease at the time of the operation. Two of the three others lived —one fifteen, and the other fourteen days after the operation. One of these died of starvation, due to the anastomosis having been made too near the ileocæcal valve; the other, from the establishment of the vicious circle. The third was still alive and in perfect health at the time of the report. His conclusions are as follows: First, the ligature. This should not be a rubber thread or flat band. These lack the necessary strength to cut with certainty through the thick walls of the stomach. It is necessary to employ hard, round, smooth, and strong rubber cords, at least two millimetres in diameter. Second, it must include in one loop all the tissues which it is desirable to sever. The formation of several small connected loops is an error. In general, the larger the amount of tissue included in the loops, the quicker and the more certainly will the ligature perform its work. Third, the cord must be drawn as firmly and tightly together as possible without breaking, and then fastened by a silk thread, which is tied around the knot. Fourth, before inserting the rubber ligature, the viscera should be joined by a row of Lembert sutures for a distance of six to seven centimetres; and

when the ligature has been tied a similar row in front should complete the function. If ever there should be an ill success with the ligature, it will, he believes, occur from its too rapid action. Failure to cut through is due to faulty technique.

In his second paper, of October 5, 1901, in the *New York Medical Record*, p. 521, he says that long years of observation of patients after laparotomy have brought him to the conclusion that in most cases the stomach and intestines are not able to avail themselves of the new channel until after the lapse of two or three days—even when the course of the wound is perfectly aseptic. The anæsthetic produces a gastric irritability lasting some hours after the injury done by the operation itself, and inhibits for an indefinite time the muscular contractions of the gut, and with it the digestion and absorption of food. The fear that the ligature will not perform its function and make a proper opening through the viscera is absolutely without foundation if the operation is properly performed. In a large number of operations on dogs, in which the intestine is much thicker than in man, he has never yet met with a failure.

The advantage of the ligature over all other methods is that it is the quickest of all operations for the production of intestinal anastomosis. There is no incision of the bowel, no loss of blood, no escape of feces, and no exposure to peritoneal infection from the bowel contents. The operation is followed by a minimum of shock and pain, and in three or four days there is an anastomosis with a union by first intention. The bowel does not slough under the ligature, but undergoes a process of absorption, and in a few days the edges of the orifices are found closely united without any raw surface whatever. The advantage of this method over the button is that the surgeon can govern exactly the length of the opening and make it large or small, as may seem best.

Simple as the operation is, its success depends upon the

observance of certain positive rules in its application: First, the choice of the rubber cord. Second, the bowels must be brought in apposition and fastened together with a row of Lembert stitches. And, finally, the rubber ligature must be buried by an additional row of Lembert stitches before the intestines are returned to the abdomen.

He says that this method is particularly applicable to all gastro-enterostomies, as well as to the entero-enterostomy which is usually made nowadays in order to obviate the vicious circle. It is also applicable in partial stenosis of the small intestines other than the duodenum. In these latter cases, as a rule, the distress caused by the narrowing of the intestine does not interfere so seriously with the general nutrition as does a pyloric stenosis. He says, however, that in complete obstructions from any cause whatever, requiring an incision into the bowel for the evacuation of gas or feces, anastomosis should be made by other methods.

In the *Medical Record* of January 25, 1902, Dr. Willy Meyer reported two cases of gastro-enterostomy with entero-enterostomy, done with the aid of the elastic ligature by the McGraw method. The first was a man fifty-two years of age, who entered the German Hospital with all the clinical symptoms of far-advanced malignant stricture of the pylorus. During the first eight days the patient made an excellent recovery. On the third day feeding by the mouth was begun, and he seemed to relish food and absorbed it, as was demonstrated by the amount of urine voided, which almost regularly was above 1000 c.c. within twenty-four hours. On the fifth day, larger doses were given, amounting to from two to three quarts of liquid. The new opening seemed to act favorably, as the patient before operation had almost regularly vomited large masses of the liquid diet that had been allowed him. On the fourteenth and fifteenth days he began to show symptoms of the vicious circle, but by the twentieth day his vomiting ceased and he made an uninterrupted recovery. On being

dismissed from the hospital in the early part of September (he was operated on in July) he had gained twenty pounds, and two months later had gained ten more pounds. This patient was presented before the New York Surgical Society, November 13, 1901. In this case the rubber ligature broke while tying the knot, an accident which has happened in two of my own cases, and Dr. Meyer says the two anastomotic openings were too close together.

The second case was one operated on at the Post Graduate Hospital, and in this case anterior gastro-enterostomy had to be performed on account of the adhesions of the transverse mesocolon. In this case Dr. Meyer used intestinal clamps in order to shut off the current into the intestine, and an entero-enterostomy was performed. The patient made a most satisfactory and uninterrupted recovery. Small doses of water were allowed on the third day. No vomiting. Steadily gained in weight and strength, and at the time of the report was within ten pounds of his normal weight.

My own experience with the McGraw operation covers only seven cases. The first, a man aged fifty-three years, born in Russia, began to have difficulty with his digestion one year before his admission to the hospital. He lost forty-five pounds during the year. Vomiting occurred within two or three hours after eating, and included everything ingested. He was operated on August 31, 1901. Incision on the outer border of the left rectus muscle, four and a half inches in length. Stomach not much dilated, but there was a growth on the posterior wall, apparently of the colloid variety. Mass of colloid carcinoma, also, about one inch from the greater curvature in the omentum. On account of the involvement of the posterior wall of the stomach, an anastomosis in the anterior wall was necessary, and this was made after the McGraw method—an entero-enterostomy being made at the same time. He suffered considerable pain following the operation, and vomited once. Feeding began on the second day, when he was allowed a

small amount of beef juice and whiskey by mouth. Temperature never went above 100° F. Pulse when at its highest point was 104. Allowed an egg on the fifth day. The upper end of the wound in the abdomen broke down under a collodion dressing. This only involved the skin, and was entirely healed by the eighth day. He complained constantly of pain, but this was probably due to the progress of the growth. His cachexia continued to increase, and on the twenty-second day the right chest, which had gradually been causing discomfort, was aspirated and half an ounce of bloody fluid withdrawn. He was discharged from the hospital on the twenty-sixth day. Gradually his symptoms increased until he died, three months later, of general colloid carcinoma of the abdomen, but without developing any further symptoms of obstruction to the intestinal lumen.

The second case, T. G., was sent to me by Dr. Max Einhorn at the Post-Graduate Hospital. Six months prior to entering the hospital he began to have loss of appetite, and since that time suffered from an intense pain in the stomach about six hours after meals. Pain of a lancinating colicky character more or less intense at irregular intervals during the attack. Stomach distended during the paroxysms; relieved by massage or vomiting. The vomitus consisted chiefly of greenish fluid with a small amount of mucus and occasionally some undigested food. No coffee grounds or bright blood in the vomitus or stools. Restriction of diet relieved these conditions for a time, but on returning to solid food the symptoms reappeared. Considerable tenderness on pressure over the epigastrium; loss of flesh; appetite good; bowels constipated. Diagnosis of carcinoma of the stomach by Dr. Einhorn. Operation September 10, 1901; abdominal incision four and a half inches along the external border of the left rectus muscle, two and a half inches below the ensiform cartilage; stomach dilated, reaching to the umbilicus. Annular tumor around the pyloric end of the stomach about one and a quarter

inches in diameter; glands in the vicinity enlarged. The posterior wall of the stomach was secured and the jejunum sutured to it for a distance of two and a half inches; continuous Lembert suture with black silk being used. This united the lower or posterior surface of the intestine and stomach. An elastic ligature was then passed through the posterior wall of the stomach in front of the line of suture and through the same point of the small intestine, following the long axis. This ligature was tied and another row of Lembert sutures taken between the stomach and the small intestine, so that the elastic ligature was completely included. An entero-enterostomy was then made in a similar manner and the abdominal wall closed. The patient was returned to the ward in good condition. He slept well the night after the operation. He had no vomiting, but complained of some pain in the left side of the abdomen. This continued for about two days. He was allowed small quantities (a teaspoonful at a time) of water or Vichy, and on the third day milk and barley-water, one drachm at a time. This was increased daily. On the seventh day his dressing was removed, and it was found that the wound had healed under primary intention. He was out of bed on the fourteenth day, and discharged from the hospital one month after the operation. When last seen, some three months later, he had rapidly gained flesh, had returned to his work, and was suffering no inconvenience from the growth.

The third case was a man, aged fifty-three years. Ten months before he began to lose his appetite and have pain in the epigastrium—especially at night—which extended to the small of the back and to the region of the bladder. Shortly afterward he began to have attacks of vomiting, sometimes immediately after eating or a couple of hours later, which was usually considerable fluid mucus. Two months later he began to have characteristic coffee-grounds vomiting, constipation, no diarrhœa. He lost forty pounds of flesh during the last three months. A hard tumor was

made out, about the size of a lemon, in the epigastric region —probably connected with the pyloric orifice of the stomach. The stomach was dilated almost to the umbilicus. Usual incision at the outer side of the left rectus. The pylorus was much involved in cancerous growth and adherent to the posterior abdominal wall and also adherent to the liver. The mesenteric glands were involved. Posterior gastro-jejunostomy was performed after the McGraw method, together with an entero-enterostomy. Operation September 16th. Very little vomiting; very little shock. Ice and small quantities of water were allowed by the mouth; on the third day, peptonized milk and some cracked ice. Dressed on the fifth day; primary union. He was out of bed on the sixteenth day, and discharged from the hospital on the twenty-ninth day. This patient lived about two months and died of exhaustion.

The fourth case was a woman, aged twenty-four years, admitted to the hospital October 17, 1901. I saw her in consultation with Dr. Quintard on November 1st. This was a most interesting patient. Eighteen months before she was admitted to the hospital she had had an Alexander operation for shortening the round ligaments; had also had a ventral fixation. Five months later she was operated upon for appendicitis. At this time apparently she must have had a great deal of peritoneal inflammation, as she began to suffer shortly afterward from nausea and vomiting, but had no pain. This occurred first at considerable intervals, but gradually the attacks became more frequent, and during the four or five weeks preceding her admission to the Post-Graduate Hospital she had severe knifelike pains in the right side under the ribs. She also had pain in the epigastrium, but this was most severe only during the week before her admission. During this last week before being admitted to the hospital the epigastric pain, nausea, and vomiting had been almost constant, so that very little nourishment was retained. The bowels were habitually constipated. Pressure on the right side

below the ribs caused excruciating pain; abdomen not generally tender, and no resistance; hyperchlorhydria. Nothing abnormal on palpation of the stomach. Laparotomy was performed November 2, 1901. The abdomen was found greatly dilated. Pyloric end drawn down to a point opposite the umbilicus. From this point the pyloric end of the stomach bent back on itself, running upward and inward, behind the stomach, to the under surface of the liver, where it joined the duodenum. It will be seen that the smaller end of the stomach had been drawn out into a tube and was bent on itself in the shape of an S. The first end was attached by adhesions to the ascending colon near its middle and within a few inches of the caput coli. This extreme flexure of the pyloric end was sufficient to cause partial obstruction of its lumen. On examination of the ascending colon the cæcum was found to be normal, the appendix having been removed several months previously, its site being represented by a dimple having encapsulated in it a small silk ligature. The colon was, however, doubled on itself, and the two portions in apposition were firmly adherent. The gall-bladder was normal and contained no calculi. All the other viscera were apparently normal. With great difficulty the adhesions between the stomach and intestine were broken up, and the colon was also straightened out. Many bands of adhesions had to be divided with the scissors. The uterus was held in good position by a single band about half an inch long and one inch in width. This was the result of the previous ventral fixation. The stomach was then pushed up into its natural position and the posterior peritoneum freshened, in order to obtain, if possible, adhesions between the denuded portion of the pyloric end and the posterior peritoneum in a normal position. Recovery from this operation was prompt at first and very satisfactory, although vomiting continued almost incessantly. About the seventh day, however, she began to retain food administered by the stomach, and on the eighth day took a poached egg on toast. The first

dressing showed primary union. By the twenty-third day she began again to have considerable vomiting and pain in the stomach, which continued at intervals, although she was able to get up, ate pretty well, and moved about the hospital. On the thirty-fourth day I saw her again with Dr. Quintard. By this time the vomiting had returned, together with the pain in the epigastrium almost as marked as before the former operation.

On the forty-second day I operated a second time and found that the ascending colon had remained practically as it was left at the time of the former operation. The usual incision was made for reaching the stomach, which was found still much dilated and reaching below the umbilicus, and the pylorus was found to be drawn down again and curved over itself in the same manner as at the time of the first operation. It was therefore determined at once to make a gastro-enterostomy. The posterior wall of the stomach being brought out of the wound, a jejuno-jejunostomy by the McGraw method was performed, and an entero-enterostomy was also made. The recovery from this operation was very satisfactory, although she suffered considerably from distention. By the seventh day she was able to take coffee, toast, omelet, wine jelly, custard, and cream of celery soup. On the eighth day the wound was dressed, with primary union throughout. She was out of bed on the sixteenth day. Convalescence was somewhat prolonged, but she left the hospital practically cured, January 30, 1902. In May or June she went to Atlantic City, and while there had a return of vomiting and pain in the stomach; and Dr. Marvel, who had been treating her, called Dr. Quintard in consultation. When he examined her he anticipated a return of the stomach trouble, and supposed that the opening made by the ligature had closed. He consequently brought her to the hospital again, where I saw her with him. My own opinion this time was that the opening from the stomach was patent. This was based upon the fact that the stomach was not

materially dilated, was decidedly smaller than at any other time when I had examined her, and that it was possible to get a wave of gas apparently through the opening. I suggested at this time that she be given some capsules containing methyl blue, and that the stomach be washed out from one-half to three-quarters of an hour following the exhibition of the capsule. If the stomach contents were then found free from coloring matter which afterward appeared in the urine and feces, I felt that we would be safe in concluding that our opening was still patent. This experiment was successful. I suggested the possibility of there being an hysterical condition and a simple hysterical vomiting—which I have several times seen following stomach operations. The patient recovered under the suggested treatment, and has remained well until within the past few days, when Dr. Quintard told me she was again having pain and vomiting.

The fifth case was a man, aged thirty-six years, sent me by Dr. Max Einhorn, November, 1901, with indefinite symptoms of a pyloric obstruction, possibly lues or cancer. He was operated upon in the usual manner, and an annular growth around the pylorus, with several enlarged glands in the omentum and behind the stomach found. Pylorectomy being out of the question, gastro-enterostomy was performed according to the McGraw method. This patient was very difficult to manage, as he had had a brother of about the same age die but a few months previously from sarcoma of the stomach, and, having watched his symptoms, he was constantly anticipating a similar train in his own case. It is rather remarkable, and perhaps may have some bearing upon the question of contagion in malignant disease, that these two men should have had an exactly similar condition, attacking the same viscus within the course of a few months. Nevertheless, this patient's recovery was fairly satisfactory. The wound healed by primary intention, and feeding was begun at the end of fifty hours, and gradually increased. At first only beef juice, squeezed

beef, and broth, together with a slight amount of stimulation, were administered by the mouth, and rectal feeding was depended upon chiefly. The patient was extremely neurasthenic and difficult to manage. He insisted upon returning home as soon as he was able to get out of bed, and travelled several hundred miles by the end of the second week. During the course of his treatment in the sanitarium he had several attacks of distention, which he insisted were due to the closure of the opening, but was immediately relieved upon the administration of a high saline enema. Shortly after his return to his home his physician called upon me to determine exactly his condition at the time of the laparotomy. The pathological examination of the gland removed from the omentum was very unsatisfactory, and Professor H. T. Brooks reported that it was probably tubercular in origin. A few weeks later I received a letter from his physician, dictated by the patient, demanding that I should go to his home prepared to repeat the operation, as he had symptoms of closure of the anastomotic opening. As this letter was accompanied by a threat that if it was found that I had not performed the operation which I had stated to him as having been accomplished, I would be sued for damages, I absolutely and emphatically declined to reply to further letters or to give any further attention to his case, unless every communication was accompanied by a consultation fee and I was guaranteed against any legal proceedings, no matter what the outcome might be.

He therefore went to Montreal, where I understand a secondary laparotomy was performed some time in February, 1902. It was found at this time that his condition was sarcoma and that the growth had spread across the stomach wall, surrounding the new opening and occluding it. His physician wrote me within a few days, saying he thought if my anastomosis had been made further away from the pylorus that he might have lived longer. At the time of the operation, however, the point selected for the

operation was about the middle of the greater curvature of the stomach, and so far as I could tell, well removed from the possibility of involvement during the life of the patient. He died in February, 1902.

The sixth case was a man, aged fifty-five years, with an easily palpable tumor in the epigastric region. While, under ordinary circumstances, we must recognize the fact that gastric tumors which are readily palpated through the abdominal wall have probably advanced beyond the point of successful operative treatment, yet I was led to attack this case because the tumor was still readily movable, and the symptoms of pyloric obstruction were not perfect. The patient was cachectic and emaciated to a degree, but his pulse was good, and he seemed in condition to stand a not too prolonged abdominal operation. The tumor was one confined to the pyloric region, evidently carcinomatous and very movable, but there was an extensive involvement of the glands, making it impossible to completely extirpate the growth. Gastro-enterostomy was therefore performed in December, 1901, by the McGraw method. The change in this patient's condition following the operation was remarkable. He was allowed water, a teaspoonful at a time, as soon as he recovered from his anæsthetic, and the quantity was gradually increased until at the end of fifty hours he was allowed the juice of squeezed beef, beef tea, and hot, strained broths. His strength began to return immediately. At the end of ten days he was out of bed, and returned home within two weeks, as he said, better than he had been in many months. He had gained several pounds—five or six—during this period, and was eating freely, taking the regular hospital diet. Unfortunately, I do not know how long he continued to improve, or whether he is still alive, it having been impossible to trace him since his discharge from the hospital.

The seventh case was a woman, aged thirty-nine years, admitted to the St. Francis Hospital, May 30, 1902, and operated upon June 2d. For a year she had indefinite

stomach symptoms, and for five months she had had vomiting from one to two hours after eating, so that at the time of her admission to the hospital she was vomiting everything taken into her stomach. No coffee-grounds material nor blood appeared in any of the ejected matter. Emaciation was rapid, and her appearance upon admission to the hospital indicated a woman of sixty years, with a typical malignant cachexia. Tumor of the size of a fist extended from the median line to the right about two inches below the free border of the ribs downward about three inches. It was slightly movable, firm, and irregular. The stomach was distended, the lower border reaching nearly to the symphysis pubis. The stomach contents showed free lactic acid, absence of hydrochloric acid, and large numbers of Boas-Oppler bacillus. The stomach held four metres. The usual incision, four inches long, was made at the outer border of the left rectus. This revealed an adherent cancer of the pylorus, a large number of infected retroperitoneal glands, many of them of considerable size. The posterior surface of the stomach being exposed and the jejunum isolated about twelve to fourteen inches below the duodenojejunal junction, gastro-enterostomy by the McGraw method was attempted. The first time the ligature broke while tying the first turn of the knot, and a second attempt was made to utilize the same openings, but the ligature broke a second time, and as the openings were now so much larger than the calibre of the rubber ligature, the method had to be abandoned and the anastomosis completed by suture, the entero-enterostomy being made by the Murphy button. In this, as in the two preceding cases, the rubber ligature made for Dr. McGraw by Nelson, Baker & Co., of Detroit, was used. The patient rallied well from the operation, and had no vomiting. The highest temperature during her convalescence was 100.5° F. Rectal feeding was continued for six days. The bowels were moved on the third day by enema. The wound healed per primam, and the patient was allowed to be up in two and

a half weeks. The button was passed on the thirteenth day. The patient left the hospital improved and able to eat and relish whatever she wanted in the way of food.

I am not sure but that this ligature might have been injured during its sterilization by boiling, and hereafter I shall have the ligature handled in the same way that we prepare the rubber gloves, instead of boiling it with the instruments.

Dr. Willy Meyer has related to me the history of a third case operated on by him at the Post-Graduate Hospital, which developed the classical symptoms of acetonuria, as described by Brewer recently.

This series of cases demonstrates, to my mind, the feasibility of adopting this method in cases of gastro-enterostomy and entero-enterostomy in stomach lesions. It would not be applicable in my opinion, in cases of entero-enterostomy necessitated by a complete intestinal obstruction. That it might be applicable, however, to cases of incomplete obstruction to the intestine, I am ready to admit. In a letter received November 8, 1902, from Dr. McGraw he relates a case of strangulated hernia in which he attempted to make the anastomosis by means of the ligature above the point of the gangrenous bowel and allowing a fecal fistula to remain in the hope that this might be closed by cicatrization after the anastomotic opening became patent. His case, however, was almost moribund when he operated, and did not live long enough to demonstrate the application of the ligature in a case of this kind.

This method of operating enables us to save considerable time, and it has some advantages over the button. One of the objections to the latter has been the comparative frequency with which it drops back into the stomach, remaining there as a constant menace to the integrity of an already diseased and possibly ulcerating organ. There would probably be little saving of time between the button and the ligature if the former is used without employing a line of Lembert sutures around it. In the McGraw method,

however, we have the advantage of being able to make as large an opening between the stomach and the jejunum as we may desire. I believe that a better and stronger elastic ligature than the one now manufactured by Nelson, Baker & Co. is desirable, and I agree that Dr. Meyer's suggestion of using a rubber cord four millimetres in size should be adopted. Although Dr. McGraw takes exception to a ligature of this size, on account of its greater bulk and the clumsiness of the knot, the mass would by no means be so large as the button, and would offer none of the objections that are recognized as pertaining to that excellent device. In entero-enterostomies, however, I believe that the button or direct lateral anastomosis by suture is preferable to the employment of the ligature. So far as the feeding of the patient is concerned, there is little to choose between any of the methods. There can be little doubt that when the ligature is employed the section of the stomach and intestine has progressed sufficiently by the end of forty-eight hours to allow of the passage of liquids, and that is as early as we can ordinarily expect to allow patients take anything into the stomach.

In my opinion, it is a good plan to administer, in all cases where the stomach is operated upon, a generous supply of peptonized milk and whiskey at the time of the operation. For many years this was my plan at the conclusion of all my gastrostomies, giving from eight to ten ounces of hot peptonized milk with an ounce of whiskey as soon as the suturing of the stomach to the abdominal wall was completed. There is no objection, so far as I can see, to inserting through a fair-sized canula the same amount into the intestine below the point of anastomosis in these cases of gastro-enterostomy. Regurgitation back along the operative field can be readily prevented by the application of an intestinal clamp, and the small puncture wound can be readily closed by one or two Lembert stitches.

DISCUSSION.

Dr. Maurice H. Richardson, of Boston.—I have been much interested in this paper, but I was not going to say anything on this subject until you unexpectedly called upon me to do so. Dr. Mixter has been a great advocate of this method in Boston, and I have heard him say that he thinks it is one of the best methods of uniting the two coils of intestine, or the stomach and jejunum. He likes the mechanical part very much. I have used it in two or three cases. I like the mechanics of it. I like the idea of the ligature being applied in such a manner that there can be no leakage at the time of the operation. My experience in anastomosis for intestinal obstruction or for any operation in which the distended intestine is cut is that it is difficult to prevent the liquid feces or contents from soiling the field. The contents are always liquid in chronic intestinal obstruction, and it is difficult, if not impossible, to prevent a large amount of this fecal matter from soiling the field, and the method of Dr. McGraw will obviate that. However, we may try to prevent soiling the field by other methods, we cannot do it so effectively as we can with the rubber ligature. I do not think I ought to say much about my own experience with this method, because it is very limited. I have been much pleased with the manner in which the rubber ligature worked, and by the immediate results, but I ought not to say that I do not like the remote results, because my experience with it has been limited to two or three cases. In one instance I made a second anastomosis after the closure of the opening by the first. But it is not fair to criticise in this way a method with which I am so unfamiliar, and I ought not to say much about it, except that it appeals to me very strongly, and if I could see it performed by Dr. McGraw himself I should doubtless see the causes of my failure in the few cases which I have had.

Dr. C. H. Mayo, of Rochester, Minn.—While we have had no experience in the method presented, there are certain questions which come up in the performance of any method of gastro-enterostomy, and these questions naturally would come under discussion, inasmuch as the essayist presented a report of cases involving the various conditions for which we perform gastro-enterostomy. It is a nice thing to be alive during this

period of rapid surgical evolution. In the last few years there is no question in my mind but what the Murphy button has done more to revolutionize intestinal anastomosis than any other one thing. It has taught us the possibilities of union of the bowel and stomach; but within the last few months there has been a rapid change. We are beginning now to discard the use of all mechanical means in performing entero-anastomosis or gastro-enterostomy, and in the next two years I predict that we will return to the methods of suturing from knowledge obtained in the use of mechanical devices. We will do gastro-enterostomy for certain conditions. What are those conditions? We have in a certain type of nervous individuals acid stomach, with closure of the pylorus; we have chronic ulcer in the region of the pylorus, with its contraction and reopening, repeated attacks; we have the acute ulcer, which is only mentioned because of this class requiring very seldom any operation such as gastro-enterostomy. Then we have the operation for obstruction of the pylorus due to contracting ulcer or to malignant disease. Among the troubles which follow gastro-enterostomy we have what is called the vicious circle. This was relieved, I believe, first, by a posterior gastro-enterostomy, because this placed the outlet of the stomach at the most dependent portion, later enterostomy was added, but if the anterior opening is made next to the omentum, the two openings, either posterior or anterior, have only separation of the omental attachment to the stomach. If the operation is made close to the lower part of the stomach the funnel effect of the stomach is produced, and we will relieve, to a great extent, the vicious circle.

There is another condition which occurs in operations for chronic obstruction of the pylorus due to chronic ulcer. You do a gastro-enterostomy; it cures the ulcer; the pylorus again opens up, and you do not get the vicious circle, strictly speaking, but you do get regurgitation of pancreatic fluid and bile back into the stomach. These cases immediately after operation gain many pounds in weight, but after nine months have elapsed will complain of a series of symptoms for which the operation was performed at first—vomiting, pain. The vomiting may not be necessarily present, but they will complain of pain, so that many of these patients who have undergone operations come back to have excision of the pylorus. So, if we are operating or doing a gastro-enterostomy for ob-

struction of the pylorus, it is sometimes impossible to state the differentiation between the mass formed by chronic ulcer and the early cancer. I believe in all such cases it is better at the primary operation to get rid of the pylorus, close the duodenum, close the stomach, excise the pylorus, and you will have relieved the after-condition. The stomach cannot be trusted to retain two openings. Later the gastro-enterostomy opening will close partially, and the condition of chronic ulcer recurs. In the performance of any gastro-enterostomy in the presence of malignant disease in which there is free fluid in the peritoneal cavity, and using almost any form or method of suture we must rely upon the lymph thrown out by the peritoneum, and unless we can eradicate the cause of the fluid in the peritoneal cavity, there will be a high mortality rate from a lack of any adhesive process.

I believe it is a good plan to leave sufficient length of loop of jejunum, so that, if necessary, at a later period, we can do entero-anastomosis. We lost one patient from that cause, in which the loop left was too short to do the operation.

As to the dropping back of the button, we have had that occur many times. I have known it to occur that two months and four months after patients have left the hospital, they have returned buttons to us which were passed. It is unwise to have the patients realize that you are in any degree worried over the button when not found. It is almost as serious a matter as that of informing a woman that she has a partially movable kidney.

Dr. Walter P. Manton, of Detroit.—While I have not had any personal experience with the McGraw elastic ligature, Dr. McGraw is a colleague of mine, and I have seen him use this method a number of times. I wish to bring out the point with reference to the extreme simplicity of the operation. It can be done in a few minutes. The incision is made, the parts drawn up and approximated, according to the size of the anastomotic opening desired, the rubber ligature is introduced into the stomach, brought out, carried into the intestine, brought out, and tied. In order that the rubber ligature may not slip, after the first half-knot is tied, a strand of silk is tied tightly around the ligature while the rubber is drawn out (illustrating), and then a second half-knot in the rubber is made. This can all be done in a few minutes.

Dr. McGraw has performed a number of operations by this

method and I believe the majority have been successful. The failure with some of the operators who have employed this method has been in not drawing the rubber ligature tight enough. The object of the small ligature is that it may be threaded into a large darning-needle. It cuts through in about three days. It is one of the prettiest, neatest, and quickest operations for gastro-enterostomy that I have ever seen.

Dr. Lloyd (closing).—There seems to be very little left for me to say in regard to this matter, except to pass the ligature around. This is one of McGraw's ligatures which I have obtained.

Dr. Mayo says that the suture is gradually displacing mechanical devices in this work. I agree with him. Years ago I gave up the use of all mechanical devices in stomach surgery, and have been using the suture again until I happened to see the article of Dr. McGraw, and then I began to use the rubber ligature. I believe it is a distinct advantage over the simple suture. The whole operation, including the gastro-enterostomy and entero-enterostomy, should not occupy over ten or twenty minutes, and this includes the insertion of the Lembert sutures and everything else. It is the quickest method of accomplishing a double anastomosis I have ever seen.

Dr. Mayo spoke of leaving a coil of duodenum and jejunum, later doing an entero-enterostomy. I believe it is better to make the entero-enterostomy at the time, if there is any chance of a vicious circle; as long as we have the occluded pylorus and loop of gut dropping backward it is better to guard against the regurgitation backward of the contents of the stomach into that portion of the duodenum, and make the entero-enterostomy at once, which will provide for the bile and pancreatic secretion, and empties whatever contents of the stomach happen to regurgitate again into this intestinal loop. The idea of making a gastro-enterostomy and entero-enterostomy at the same sitting is an advance in stomach surgery.

Dr. Manton spoke of the extreme simplicity of the operation. It is the quickest and simplest method of making a suture, requiring only a single line of Lembert stitches.

INDICATIONS FOR EXTIRPATION OF THE GALL-BLADDER.

By Maurice H. Richardson, M.D.,
Boston, Mass.

The so-called *ideal operation* upon the gall-bladder, by which that viscus is immediately closed after the removal of gallstones, seemed, when first proposed, an effectual and permanent method, making the tedious process of drainage unnecessary and the firm closure of the abdominal incision possible. It was, however, soon demonstrated by the most experienced observers that the essential thing in most, if not in all biliary affections, is drainage of the biliary passages. When, furthermore, it appeared that immediate closure of the gall-bladder might be followed by grave disaster, ideal cholecystotomy was regarded first with suspicion, and finally with well-merited disapproval. Indeed, the operation has no longer any place in the surgery of the gall-bladder.

In the beginning of one's experience in the surgical treatment of gallstones, removal of the gall-bladder, by destroying at a single blow the *fons et origo mali*, seems a very efficacious and satisfactory procedure. As one's experience broadens, however, it is seen that, in reality, removal of the gall-bladder is an operation which has distinct limitations; that no matter how advantageous this operation may be in theory, in practice it has disadvantages, immediate and remote, which require careful consideration.

At the present time observers differ widely as to the best methods of procedure in these biliary affections which in-

volve, directly or indirectly, the gall-bladder. Some whose opinions I respect very highly have advocated extirpation of the offending gall-bladder as a routine operation, just as they would advise extirpation of the vermiform appendix; but I have reserved the operation of cholecystectomy for cases in which the gall-bladder has in itself attributes which sooner or later threaten life. I may, however, in time become convinced that in all cases of gallstone disease the best treatment will be to remove the gall-bladder with the gallstones. At present, for reasons which I shall give in detail, my tendency, though perhaps on the whole toward more frequent resort to cholecystectomy, is decidedly against the universal application of that remedy. The analogy between the gall-bladder and the appendix is not complete—the one has a definite and evident physiological purpose; the other, if it has a physiological function, has one that is neither evident nor definite. The one is a receptacle for an aseptic secretion; the other contains material which, normal or abnormal, is highly septic and infectious. The one can serve a useful physiological purpose, after being operated upon; the other cannot. The one permits operation upon itself of vast benefit to communicating structures; the other permits no operation upon itself except total destruction. The one is seldom in itself suddenly menacing to life; the other is frequently so.

Feeling considerable uncertainty as to the best method of procedure under varying conditions of disease affecting the biliary apparatus, I have undertaken to present the arguments, based upon theory and upon experience, which now influence my decision whenever the question of extirpating a gall-bladder arises. I have no doubt that within the next few years the accumulated experience—which undoubtedly will be great, now that the advisability of operating early upon offending gallstones is generally admitted—will have led to as well-defined opinions as those of the past few years in reference to the treatment of the offending appendix. No satisfactory decision of the questions relat-

ing to extirpation or non-extirpation of the gall-bladder can be reached until we know, by the lapse of sufficient time, the comparative late effects of both. The end-results in simple cholecystotomy are certainly as gratifying as end-results have ever been in any class of abdominal operations. The remote effects of cholecystectomy must indeed be extraordinary to improve upon those of cholecystotomy.

Advantages of cholecystectomy:

1. The wound heals immediately, and the liability to hernia is therefore slight.

2. There is no possibility of gallstones forming in the gall-bladder.

3. There is no possibility of a subsequent cholecystitis.

4. There is no possibility of malignant growths starting in the gall-bladder.

5. The formation of adhesions is reduced to a minimum.

Disadvantages of cholecystectomy:

1. There is no possibility of draining the biliary passages, except through one of the ducts, and that only after a difficult and unsatisfactory operation.

2. There is greater danger in the operation.

3. Re-drainage of the biliary passages is extremely difficult and dangerous.

Advantages. 1. *The wound heals immediately, and the liability to hernia is therefore slight.* The tendency to hernia in wounds high up in the abdomen is less than in those of the lower half. I have seen, however, very large herniæ in the abdominal scar after cholecystotomy and drainage. The liability to hernia is greater when the drain is left at the lower angle of the wound than when it is left at the upper angle or in the centre; it is less when the cut is made through the rectus than when it is made across the oblique muscles. In all operations, even when the gall-bladder is extirpated, I use a gauze wick for two or three days. Strictly speaking, therefore, the wound is not immediately closed. Nor, in fact, is it completely closed, for I use no buried suture at the upper angle. The wound, neverthe-

less, closes practically by first intention after aseptic cholecystectomy, and hernia is decidedly infrequent. In other words, the tendency to hernia is reduced to a minimum.

If it were safe to close the abdominal wound after cholecystectomy, then immediate closure, with every possible precaution against hernia, might be practised. Unfortunately, bile frequently escapes from the depths of the wound, even if the cystic duct has been isolated and tied. A drain, preferably of gauze wrapped in rubber pellicle or tissue, is essential, for there is no telling when there may be an escape of bile from the pedicle of the gall-bladder.

2. *There is no possibility of gallstones forming in the gall-bladder.* That there is no possibility of the re-formation of gallstones after cholecystectomy cannot be maintained. Nevertheless, the formation of gallstones elsewhere than in the gall-bladder itself is extremely unusual. In the cases in which no stones are found except in the common duct, the original source of the stones is of course uncertain, though a history of gallstone colic without jaundice preceding the jaundice of final impaction, indicates the gall-bladder as the seat of origin.

Two cases have recently come under my care which illustrate the possibilities of gallstone formation in the hepatic duct. In the first case the gall-bladder, the cystic, the hepatic, and the common duct, were enormously distended with gallstones—three hundred in number. The gall-bladder and the cystic duct were emptied through the fundus, the common and hepatic through the common duct. The common and hepatic ducts were as large as the gall-bladder. Gallstones were removed from the hepatic duct as far as the instruments could be inserted. All were, we supposed, removed. Drainage was made through the gall-bladder, the wound in the common duct being securely and successfully sutured. The patient, after a stormy convalescence, during which a hundred and fifty gallstones were discharged through the gall-bladder, made a good recovery.

In another case I removed three gallstones, two of which

were in the common duct and one high up in the hepatic. This patient had been operated upon six months previously by another surgeon, who drained the gall-bladder for cholecystitis, but found no stones. The patient had been jaundiced off and on for two years, with typical attacks of gallstone colic. In this case the gallstones probably formed in the gall-bladder, and were retained in the common duct. The impaction of one stone was followed by dilatation of the common and hepatic ducts, where the two other stones had room enough to pass upward into the liver or downward until they touched the impacted stone.

As the chief etiological factor in the production of gallstones are micro-organisms, upon which or upon the products of which biliary salts are deposited, it is reasonable to conclude that where infections exist gallstones may form. It is only in the gall-bladder, however, that infectious products remain long enough for the deposit of cholesterin and lime salts. They stagnate there, and permit the deposit of solid material. In the biliary stream of the hepatic ducts these products do not remain long enough to permit the formation of stones, unless diverticula exist in which the bile remains motionless long enough to allow the nucleus of a stone to form. Even then the constantly increasing diameter of the hepatic radicles offers no obstruction to the disentanglement and the floating away of the small calculus. There is every reason, in theory and in practice, for thinking that the hepatic and the common ducts are but rarely the seat of origin in gallstones.

It may be assumed, therefore, that practically all gallstones are formed in the gall-bladder, and that, once the gall-bladder has been removed, the chance of re-formation is extremely small. But is not the chance of re-formation in the gall-bladder after drainage extremely small? It certainly is small—just how small it would be hard to say. Assuming that the etiology of gallstones requires first an infection of bile, the probability of re-formation would be less than in the first instance, for a second infection would

require a fresh source of micro-organisms, and, moreover, there would be fewer years of life in which to incur that infection. On the chances, a second cholelithiasis would be highly improbable. In the patients operated upon for gallstones by cholecystotomy and drainage the subsequent history has been one of freedom from pain and other evidence of gallstones. In the one or two cases in which there have been attacks of pain suggesting gallstones, the gall-bladder had been opened and immediately closed; there had been no drainage of the biliary passages. The great advantage of drainage is the thorough cleansing of the biliary passages of all abnormal elements which might serve as nuclei for the deposit of biliary salts. And yet it seems not unreasonable to suppose that, in the gradual closure of the gall-bladder opening, some at least of these abnormal elements must at the last moment be retained in the gall-bladder and be gotten rid of through the normal channels.

Practical experience goes to show that the recurrence of gallstones after cholecystotomy is very unusual, unless ligatures or sutures remaining in the gall-bladder wall are cast off into the gall-bladder. I have heard of but one such case, that reported by the late Dr. Homans.

Whatever may be the possibility of gallstone-formation in the hepatic radicles, there is certainly none in the usual nidus of gallstones—the gall-bladder—after removal of that viscus.

3. *There is no possibility of a subsequent cholecystitis.* This is a distinct advantage in cholecystectomy. The occurrence of infections after the removal of stones, and drainage, must be admitted. In some instances it becomes necessary to drain a second time. I have never found fresh gallstones at the second operation, though I have in several instances found a stone impacted in the cystic duct. In several of my operations for cholecystitis (see *American Journal of the Medical Sciences*, June, 1898) the patient's condition was too serious to permit more than the briefest

possible manipulations for drainage. Experience since the publication of that paper has convinced me that gallstones are almost invariably the exciting cause of cholecystitis, and that careful search for gallstones will usually result in their detection. Re-infections of a gall-bladder which was not at the time of operation in an infected condition are extremely unusual. If re-infections do occur in any considerable number of cases, it must be only a question of time when gallstones will re-form.

The remote results after drainage of an infected gall-bladder are brilliant, even if the gall-bladder has been the seat of repeated infections. The prolonged drainage of infected gall-bladders, usually made necessary in the process of closure, seems, with the removal of gallstones and the products of germ life, to produce not only a complete restoration of the gall-bladder to the normal, but to exert a permanent curative influence. It would, nevertheless, seem contrary to common-sense that an inflamed gall-bladder, perhaps thickened and more or less contracted, should be made by drainage as free from the danger of renewed infections as the normal or the comparatively normal gall-bladder. It is the danger of these subsequent possibilities of acute gall-bladder disease which inclines me toward a total extirpation when in doubt.

4. *There is no possibility of malignant growths starting in the gall-bladder.* The irritation of gallstones, or of chronic inflammations dependent upon or accompanying gallstones, is undoubtedly a prolific source of malignant disease of the gall-bladder, the frequency of which is well known. This danger is a distinct and favorable indication for cholecystectomy whenever there is evidence at the time of operation that extensive inflammatory changes, unlikely to subside under drainage, have already taken place. Whenever a gall-bladder presents the least evidence of a new-growth it should be removed; when it is so thickened and contracted as to make complete recovery under drainage unlikely, it should also be removed.

5. *The formation of adhesions is reduced to a minimum.* Permanent fixation of the gall-bladder to the abdominal wall is sure to follow whenever suturing of the fundus is one of the steps of cholecystotomy. Various unpleasant sensations have been attributed to this cause. Chief among these discomforts has been a sensation of pulling or dragging. My experience has been, almost without exception, that no such results follow fixation of the gall-bladder. All my earlier operations were performed by suturing the gall-bladder to the edges of the abdominal wound. Of late years I have given up suturing entirely. Drainage is accomplished and maintained by fastening a large rubber drainage tube into the gall-bladder by means of a purse-string suture of silk. This method proves satisfactory, and is chosen because it is more rapid and it prevents absolutely the escape of bile, either into the abdomen, the wound, or the dressing.

Whatever method of cholecystotomy is used, adhesion of the fundus to the abdominal wall, or near it, is sure to follow. Moreover, adhesions to surrounding viscera are almost sure to form. I have operated a second time in quite a number of cases of cholecystotomy, and I have found, as a rule, the gall-bladder adherent. In a great many cases of gallstones the gall-bladder is found at the first operation everywhere adherent. Separation of these adhesions is always followed by renewed adhesions, and yet the adhesion in itself is, as a rule, productive of no discomfort, as far as the gall-bladder is concerned. It is true that adhesions to the pylorus and duodenum may at times seriously interfere with digestion; but adhesions of the gall-bladder *per se* seldom cause discomfort.

Extirpation of the gall-bladder will be followed by adhesions, but by adhesions much less extensive than adhesions to the gall-bladder. This advantage for cholecystectomy is an advantage, but one of little weight.

Disadvantages. 1. *There is no possibility of draining the biliary passages except through one of the ducts, and that*

only after a difficult and usually an unsatisfactory operation. After removal of the gall-bladder, drainage of the biliary passages is possible only through the open end of the cystic duct left after cutting away the gall-bladder, or through an opening in the hepatic or the common duct. The hepatic duct in the normal condition is too small for the use of any but the smallest drainage tubes. Drainage up to the abdominal wound by means of gauze strands is too dangerous and uncertain. Search for the common duct is difficult and often dangerous. Moreover, the insertion of a tube into the common duct undilated is difficult and unsatisfactory. The chance of causing stricture or even obliteration is enough to condemn it. When the ducts are dilated, drainage may be easy. I have seen a cystic and an hepatic duct large enough to admit the forefinger, and, therefore, a satisfactory tube. The common duct I have seen as large as a gall-bladder. Drainage in such cases is, as I say, easy and satisfactory; but the cases themselves are extremely unusual, and they are moreover always associated with a permanent impaction of the common duct, with jaundice.

In the difficulties of immediate drainage lies the chief objection to cholecystectomy. In my experience this question is the essence of the whole discussion, for enforced and persistent drainage is one of the chief factors in bringing about the brilliant permanent results seen after cholecystotomy. By drainage the biliary passages are immediately relieved of all abnormal contents. The biliary discharges undergo in the course of drainage changes in physical appearances that are extraordinary. The beneficial effects of these changes are seen not only in the liver, but in the pancreas. Indeed, I have known a tumor of the pancreas large enough to be felt through the abdominal wall to disappear entirely under a few weeks' drainage through the gall-bladder, while the symptoms caused by this condition subsided completely and permanently. In three recent instances simple drainage through the gall-bladder was

effectual in causing the rapid disappearance of jaundice dependent upon an enlarged pancreas, which enlargement itself quickly subsided.

Drainage is, in most biliary affections, not only an advantage, but an absolute necessity. When, therefore, it is proposed to remove the gall-bladder, it is proposed to dispense with what is, in my opinion, an essential feature of the majority of cases of biliary surgery.

2. *There is greater danger in the operation.* This proposition is one of the self-evident truths that would not justify repetition were it not said so frequently that the operation is an easy as well as a safe one. Cholecystectomy may be extremely easy. So may hysterectomy be easy; but, in an easy hysterectomy, wounding of the ureters is also easy. Indeed, the easier and quicker the hysterectomy the larger the proportion of cut and tied ureters. So in cholecystectomy, facility and rapidity may lead to hemorrhage, to wounds of the duodenum or colon, and even to ligation of the common or the hepatic duct. Cholecystectomy is not always an easy operation, nor is it always a safe operation. It has possibilities of difficulty and of danger which should be strongly emphasized. Hemorrhage from the denuded liver is in itself at times a very formidable complication and one that will tax the operator to control. The gall-bladder at its neck is in close relation with structures of the first importance. Even when the anatomy is normal, isolation of the cystic duct may be at times difficult, even in the hands of a skilled anatomist. When the parts above the foramen of Winslow are buried in inflammatory masses, isolation of the cystic duct may be practically impossible. The operator will be blindly cutting in close proximity to the portal vein, inferior cava, or duodenum, the appearances of which will be unrecognizable and the relations indistinguishable. It may even be necessary in extirpation of the gall-bladder to resort to Mayo's device of stripping out the mucous membrane, as at times it is necessary to do in similar conditions of the appendix.

3. *Re-drainage of the biliary passages is extremely difficult and dangerous.* The difficulty of draining in the future, after cholecystectomy, seems an important consideration, especially when it is proposed to remove the gall-bladder in all operations for gallstones.

It is doubtless true that by removing the gall-bladder the chances of gallstone cholecystitis or other conditions requiring drainage are enormously diminished; but, nevertheless, conditions may arise in which drainage will become necessary. What can be done in the future, if drainage is imperative and there is no gall-bladder? It will become necessary to drain through the common or the hepatic duct, which must themselvse be isolated and opened in the depths of a region presumably buried in adhesions of long standing. Such an operation is possible, but it must be regarded as one of the greatest difficulty and danger.

Conclusions. 1. Certain lesions in themselves demand removal of the gall-bladder whenever possible. Such are new-growths and gangrenes.

2. Certain other lesions of the gall-bladder are better treated by cholecystomy. These are the contracted and inflamed gall-bladders, with thickened walls. All gall-bladders which do not permit easy and efficient drainage should be extirpated, for in such gall-bladders the risks of drainage are quite as great as the risks of extirpation, and the one great advantage of retention is impossible—retention of the biliary reservoir to fulfil the functions of that reservoir, and to permit, if necessary, renewed drainage in future years.

3. Drainage is preferable in the dilated and infected gall-bladder, which, however, is neither gangrenous nor to any great extent changed—the slightly thickened gall-bladder containing gallstones and infected bile. This gall-bladder will, after drainage, become normal, and therefore capable of fulfilling the functions of a gall-bladder. Through it the biliary passages will become effectually drained after subsidence of the temporary swelling about the cystic duct.

4. As a rule, drainage rather than extirpation is demanded in acute cholecystitis with severe constitutional symptoms, when the gall-bladder is dilated, or at least not contracted, and when it is not gangrenous.

5. In chronic cholecystitis, with dilatation and thickening of the gall-bladder, especially when a stone is impacted in the cystic duct, extirpation is the preferable operation, unless the stone can be dislodged backward into the gall-bladder, in which case drainage is, if not preferable, quite as advantageous as extirpation.

6. In simple gallstones, without visible evidence of infection or chronic changes incompatible with complete restoration of function, simple drainage of the gall-bladder is indicated.

7. In chronic pancreatitis, whether associated with gallstones or not, drainage through the gall-bladder is indicated. Cholecystectomy is unjustifiable, for immediate drainage is essential. Furthermore, reopening of the biliary passages may in the future be required.

DISCUSSION.

Dr. C. H. Mayo, of Rochester, Minn.—I am sure we are all greatly indebted to Dr. Richardson for his admirable paper.

There is one point that impressed me very forcibly when he brought up the indications for the removal of the gall-bladder, namely, malignancy. The various surgeons who have had a sufficiently large number of cases and experience in this line of work, and those who have made many post-mortem examinations presenting records of primary cancer of the liver, have claimed to find gallstones present in primary cancer in from 68 to as high as 96 per cent. of all cases. But 15 per cent. of such cases of primary cancer occur in the common duct. In our own experience, in 421 cases of operations upon the gall-bladder 21 were for cancer, so that the necessity for removal of the gall-bladder will enable us many times to prevent cases of carcinoma from occurring in the cystic duct due to the long-continued irritation of the impacted stone or stones.

I would like to see the term gallstone disease dropped. We should speak of it as gall-bladder disease, a term which would specify all of the indications. Of course, it is satisfactory to find a gallstone present. It may make one feel good to show a gallstone as the result of the operation, yet it is not necessarily the presence of the gallstone that has much to do with the indications for the necessity of operations upon the gall-bladder.

We have been credited with the removal of the mucous membrane of the gall-bladder, which is merely an incident in the evolution of gall-bladder surgery. These cases are plentiful, and the surgeon will soon learn the possibilities of surgery in this region by having many cases. Now we do cholecystectomy more frequently than we do removal of the mucous membrane of the gall-bladder.

In looking over the photographs and figures presented, I was impressed with the fact that in many instances of total removal of the gall-bladder there was but a small attachment to the liver. We see many cases where there is a small attachment to the liver, and in these it is easier to do a cholecystectomy. In other cases the gall-bladder is attached to or embedded into the liver, and, in them, the hemorrhage is difficult to control, and the dangers of removal of the whole gall-bladder are greater than the removal of the mucous membrane, so that in cases where the stomach is adherent, the duodenum adherent, and there has been long-continued chronic inflammation, we still resort to the removal of the mucous membrane of the gall-bladder.

I believe the essayist stated that in every case where the stone is impacted in the cystic duct he recommends removal. I still believe that with free drainage of bile to the surface, the safer it is for our patients, and the less temperature and less vomiting they will have. In almost every case in which we resorted to free biliary drainage after the removal of the gall-bladder or the mucous membrane, never tying off the cystic duct, they recovered. But in those cases where such drainage was not instituted after the operation there was temporary stasis of peristalsis of the duodenum, and these patients complained of regurgitant vomiting of bile and of pancreatic secretion, the bile flowing into the stomach, so that we should make every effort to get free drainage. In the presence of enlargement of the pancreas, if there are no gallstones present,

in a case of old cholecystitis, possibly there has been a gall-stone which has passed down and irritated the common duct and outlet of the pancreas, and we may have a temporary swelling of the pancreas, with obstruction to the flow of bile, and these cases recover with drainage. In other cases the gall-bladder is widely distended, with chronic disease of the pancreas, and where it is drained to the surface there is maceration of the skin from prolonged drainage, so that I believe it is a good plan to save the gall-bladder and establish union with the bowel; if possible, with the duodenum; but if not readily done we have secured as good results in about an equal number of cases by drainage into the colon. There is practically no difference between drainage into the colon and drainage into the duodenum. Sometimes a long incision is necessary in such a complete operation as the essayist described. In some of these cases, by making a stab wound an inch and a half in length to the outer side, more direct drainage can be obtained for the same region of the gall-bladder, and immediate closure of the long incision. In making this long incision we can guard against some of the dangers of hernia by not incising the muscle, but the sheath, thereby enabling us to secure a large abdominal opening.

Dr. J. Henry Carstens, of Detroit.—It would seem rather peculiar that I should venture to discuss this paper, as I cannot report 500 cases or as many as Dr. Richardson. However, I have had quite a few. It looks to me as though it depends a great deal on the case, and although Dr. Richardson has had so much experience, I must disagree with him that it is bad surgery to close the gall-bladder. I hold that if we have a clear case of simple gallstones, and there is no stone in the common duct, and the gall-bladder is not infected, it is good surgery to make an incision in the gall-bladder, and remove the stone. I feel down to the common duct, and if there are no stones I sew up the gall-bladder; I apply a little aristol to prevent adhesion, drop it back, and I hold that is good practice. If I have another case where there is, in conjunction with gallstones in the gall-bladder, a gallstone in the common duct or cystic duct, I think it would be better to take out the gallstones and drain than to do cholecystectomy. As a general rule, however, the duct is hard to close; you cannot close it perfectly, and you have got to drain down to the gall duct. If I drain down to the gall duct I might as well

drain the gall-bladder, and in such a case I would drain both together, inserting in each a small tube. Let me suppose that I have another case where there is no jaundice, but the patient is suffering from sepsis. It is a *suppurative* case. I get at the gall-bladder; I loosen the adhesions, if necessary, and sometimes there are adhesions all around it. Without opening the gall-bladder I pull it out to the external wound and carefully attach it before making any opening. There is a septic gall-bladder without any gallstones in the gall duct; now when I have carefully sewed up the abdominal wound and I know there is no danger from leakage into the peritoneal cavity, then I open the gall-bladder, wash out the gallstones, and do not have any fear of infection of the peritoneal cavity. That case I drain. I have another case where there are gallstones, or perhaps no gallstones; where there is sepsis, or no sepsis, but in which there is jaundice, and I suspect there are gallstones, I open the abdomen, feel around, and I find that there is no gallstone either in the common or cystic duct, but there is evidently duodenal catarrh, catarrh of the common duct, and swelling of the mucous membrane which prevents the passage of bile into the intestine. That case I would stitch to the external opening and drain in order to give the mucous membrane and the submucous tissue swelling a chance to subside by drainage. That is about the general principle. If I have another case in which there are extensive adhesions, so that I can hardly reach the gall-bladder, I do not remove the adhesions, as nature will take care of these, but I open the gall-bladder and drain it, and these patients do very well. There are other cases in which I can extirpate the gall-bladder without much trouble, where the attachment of the gall-bladder to the liver is half an inch, or you could stretch it out. If it is firmly attached to the gall-bladder it is a difficult thing to remove the gall-bladder, and I leave it in.

Dr. Robert T. Morris, of New York City.—Just one point in regard to the remarks of Drs. Mayo and Carstens, who said they would not excise some gall-bladders because of the danger of the re-formation of adhesions, and that is the use of the membrane suggested by Cargile some time ago. It is the sterilized peritoneum of the ox, and is particularly useful in this position. Where we separate extensive adhesions and apply this sterilized peritoneum of the ox, it becomes adherent.

at once. It is absorbed in from ten to thirty days. You have to be very careful in applying it, as it will adhere to anything that is moist. If we apply it merely to points separated from adhesions, it becomes adherent immediately, and acts like peritoneum. It is an amplification of Senn's omental graft, except we have any amount of peritoneum at hand. This sterilized peritoneum makes a new peritoneum. It is an extremely valuable resource in this position. I used it in a case just before leaving home, in which there were very extensive adhesions between the gall-bladder, omentum, and duodenum.

Dr. Miles F. Porter, of Fort Wayne, Indiana.—There is another reason for avoiding the removal of the gall-bladder which was incidentally touched on by Dr. Richardson when he referred to the necessity of retaining it for the purpose of drainage. I take it the majority of us suppose that Dr. Richardson meant that the principal necessity for drainage lies in the cholangitis that remains. There is another reason for retaining the gall-bladder, that is, in order that it may still remain possible for the bile to be retrojected into the gall-bladder rather than up through the pancreatic duct and into the pancreas, which would result. If there were no other good reason for not removing the gall-bladder, I am firmly convinced that this would be a sufficient reason for allowing it to remain if there were not really strong reasons for its removal.

Dr. A. Palmer Dudley, of New York City.—I desire to report a case, the last one I had, as illustrative of the danger of not removing the gall-bladder. This was a case in which an operation for hernia was done by a colleague of mine some four years ago, and in doing this operation gallstones were discovered in the gall-bladder. He made another section and drained the gall-bladder, removing the stones and allowing the gall-bladder to remain. Two weeks ago I removed the imprisoned stone in that gall-bladder that had worked its way up through the duct and became lodged between the peritoneum and the tissue of the external structures, preventing healing of the fistula for four years. It was supposed that the patient had a suppurating gall-bladder as the result of the tentative treatment four years ago. It complicated the complete removal of the gall-bladder; still it was accomplished by the methods described to-day, and the patient recovered. I simply want to add this case to Dr. Richardson's report, in

order to show that in many cases it is dangerous to leave the gall-bladder, because of the fact we are not sure that there is not a small stone which will afterward work its way up.

Dr. Edwin Ricketts, of Cincinnati.—As has been said by one of the speakers, the removal of the gall-bladder rests with each individual case *after* the abdomen is opened. I will acknowledge that possibly I am a little old-fogyish on this line, but I must say that I have never seen the necessity confront me in which I felt it was necessary to remove the gall-bladder.

I recall a case that was operated upon by me some few years ago in which there were fifty-seven stones removed, and I thought at the time that I had removed all of them. I felt sure of it. I did a cholecystostomy, and drained the gall-bladder, in order to get rid of the infection which had existed for three or four years. The patient gained thirty pounds in weight, *and I was gratified six months afterward, after keeping the sinus open, to have a stone expelled, and the patient recovered.*

Like Dr. Mayo, I dislike the term gallstones. I wish it were eliminated from the category, and if I had my way it would be infections and gallstones, and not gallstones and infections. I have never seen a case in which I was not satisfied *that infection was the first thing to be considered, and, therefore, drainage in many of these cases is the most important factor*, and with cholecystotomy, you have, at the time of doing the operation and after, control of the situation. After a cholecystotomy has been done, it is much easier to deal after with the gall-bladder than it is possible after the performance of a cholecystectomy, with the possibility of extensive adhesions between the abdominal incision, and the point at which the gall-bladder has been removed.

Dr. Alexander Hugh Ferguson, of Chicago.—I presume every surgeon has laid down certain rules to guide him as to whether he should remove the gall-bladder or not. The removal of the gall-bladder has for its consideration conditions of the gall-bladder itself, and those of both the cystic and common ducts. Upon opening the gall-bladder and finding bile in it, this is a cue that drainage of the gall-bladder is the wise thing to do. It points out that the cystic duct is open, and we do not know how necessary it is to keep it open for drainage purposes. In all chronic cases of cholelithiasis without obstruction of the common duct I do not remove the gall-bladder. There may be a certain amount of constriction

in it, and if I remove the gall-bladder and tie the cystic duct the common duct may not be able to take care of the amount of bile that is secreted in a day or two following the operation.

In retention cysts of the gall-bladder it ought to be removed. In hydrops of the gall-bladder, when no bile comes into it while operating, it should be removed when the cystic duct is not open, but if air can be forced into the duodenum extirpation is not clearly indicated. It is unnecessary to always break down all the adhesions to the gall-bladder. If they are causing obstruction of the pylorus, the duodenum, or the hepatic flexure of the large bowel, then, of course, liberate these structures. If not, leave them alone. In a gall-bladder that appears to be somewhat buried in the liver, make an incision close to the duct and along the gall-bladder, instead of over it. In cases of empyema of the gall-bladder, drainage should be resorted to. In carcinoma of the gall-bladder, I have removed it a number of times, but they have all died.

Ideal cholecystotomy, now praised by Dr. Carstens, is the most unideal operation ever practised on the gall-bladder. Of course, they are all originally infected cases, and often we do not know whether infection is there or not while we are operating; hence, the safe rule of always draining the gall-bladder instead of sewing it up and dropping it back into the abdomen, to take care of itself, which it may not do.

Dr. M. C. McGannon, of Nashville.—In connection with gall-bladder surgery, I have been impressed with the fact that there must be a definite reason why gallstones, especially small ones, do not escape from the gall-bladder down through the cystic and common ducts into the bowel. The explanation I have given for it is that when we open the gall-bladder we find it full of mucus, the mucous surface along with the stones being matted together, preventing their escape from the gall-bladder into the ducts. The stones are arrested here, and the mucus accumulates because we have infection.

Dr. Carstens.—I would like to know how Dr. McGannon knows there is infection of the gall-bladder. He says there is infection. How does he know that there is infection of the gall-bladder at the time he is operating?

Dr. McGannon.—I presume it is a simple matter to find out if we submitted the subject to a pathologist. But we presume, if we have a chronic catarrhal condition of the gall-bladder—a catarrhal condition which manifests itself by the

accumulation of mucus which is thick and tenacious, matting together five hundred small stones in the gall-bladder—there is more or less infection. I am sure, I have opened a gall-bladder and have found more than five hundred small stones matted together by mucus, preventing their escape, the mucus being poured out from the chronically inflamed gall-bladder. It seems to me that is sufficient to answer the question. Those cases should be drained, and anything short of drainage I would consider bad surgery. In the more pronounced cases, where infection is more severe than that, we do not find accumulation of mucus to the same extent. A changed condition takes place; we find no serum, and probably seropurulent collections in the gall-bladder, and if it progressed a little further we would have the condition of a woman upon whom I recently operated. She was sixty-nine years of age. In that case there was empyema of the gall-bladder, with a large stone present. The gall-bladder had been inflamed for a long time, as was shown by the symptoms presented. There were practically no symptoms of gallstones, but the symptoms were those of appendicitis in the later stages. A diagnosis of appendicitis was made by an excellent physician previous to that time. It was supposed that the patient was suffering from intermittent fever, and she was under treatment for three months for intermittent fever. Eventually the case became more pronounced in symptomatology, when I saw the case in consultation, diagnosed empyema of the gall-bladder, and at the time of operation I found a collection of pus in the gall-bladder and stones causing the empyema. Drainage proved satisfactory in this case, and the patient recovered.

Dr. J. H. Carstens.—I would like to ask Dr. Richardson if he has had examinations made of the mucous secretions referred to in his paper?

Dr. Richardson (closing).—In reply to the question of Dr. Carstens, I have had some of the secretions of the gall-bladder examined by a pathologist, and cultures made, and he has found all sorts of infections. I have been surprised to find in many cases infections where I expected to find none. I assume that all gall-bladders are infected, and treat them accordingly.

This is a very broad subject, and the question of removing the gall-bladder was brought up because I think the tendency

is to remove gall-bladders too frequently, and I think that our experience is beginning to show that drainage is the essential feature of gall-bladder surgery, whether there are gallstones present or not. I agree with some of the speakers that it is the condition of the biliary tract that demands operation, and that the removal of the gallstones is an incidental feature.

I have been extremely interested in the discussion, and there are several points that have been brought up which have interested me very much. I did not intend to speak of the technique of the operative methods, either ideal cholecystotomy, or sewing up the gall-bladder immediately. The process of evolution through which we are going and through which we have passed in regard to the appendix is a slow one. We come to a consensus of opinion after many years' experience, and the question is whether we have had enough experience to answer this question in regard to the gall-bladder. I mentioned ideal cholecystotomy as an operative procedure which I had supposed was obsolete, which the most experienced surgeons had abandoned, not on the ground of infection, because if you sew up the gall-bladder tightly you may have left it in a bleeding point, the gall-bladder may fill up with blood under great pressure, and your stitches give way. It is a mechanical reason. I have been much alarmed in a few cases, and the last one of the kind Dr. Carstens spoke of, in which it seemed a great advantage to the patient to get immediate closure, I was horrified at the end of the first twenty-four hours in that case. I was much frightened by the condition of the patient, and I declared that I would never sew up a gall-bladder again, and I believe every surgeon of experience will go through what I did if he keeps up ideal cholecystotomy.

ANTERIOR TRANSPLANTATION OF THE ROUND LIGAMENTS FOR DISPLACEMENTS OF THE UTERUS.

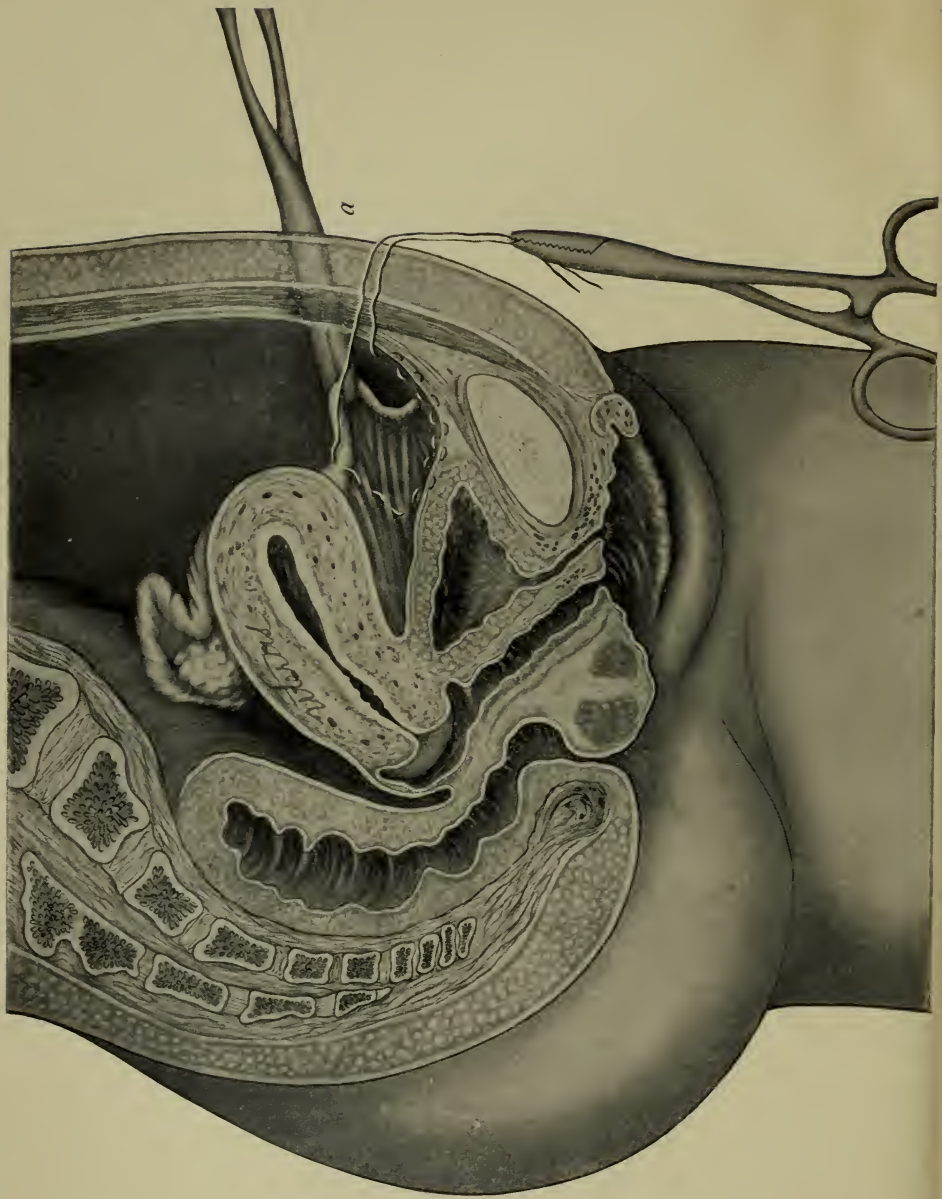
By Alexander Hugh Ferguson, M.D.,
Chicago, Ill.

At the annual meeting of the American Medical Association in Denver, in 1899, I presented a preliminary report of an operation entitled "Anterior Transplantation of the Round Ligaments for Displacements of the Uterus" (*Journal of the American Medical Association*, November 18, 1899). I performed my first operation April 27, 1896, for an anteflexion that had resisted well-selected non-cutting procedures by others as well as myself, including a forcible dilatation. At the meeting above referred to, I simply mentioned that I had operated in twenty-two cases, and that one of these became pregnant and gave birth to a child at full term without any trouble.

On August 21, 1897 (*Centralblatt für Chirurgie*), Dr. Carl Beck, of New York, published his operation, "Eine Neu Methode der Hysteroplexie," which he had then performed four times, but no data were given of his cases. It consisted in suspending the uterus by one round ligament at the lower angle of a median abdominal incision. I mention this in order to prevent confusion of his method with that described by me, and which I now elaborate.

It is now over six years since I first carried out the principle of this operation. The abdominal wall was opened in the midline in my first few cases. I then thought it better

Fig. 1.



to enter the abdomen through each rectus muscle, the skin alone being cut in the median line. After doing fifty cases in this manner, I returned to the one incision in the abdominal wall, and that at the linea alba, then bringing the round ligaments through stab wounds, one in each rectus muscle. In about one-half of these cases I severed the round ligaments and brought their stumps through the rectus muscles, while in the remainder the ligaments were not cut at all.

It must be admitted that with this technique there was danger of the bowel or omentum, or both, slipping between the transplanted round ligaments and the bladder, and producing such complications (strangulation of the bowel, etc.) as have been known to occur after Kelly's suspension and other methods of hysteropexy. In order to prevent these complications I have employed one of two procedures to render it impossible for bowels to slip around the uterus beneath the round ligament:

1. A continuous suture is made running along the parietal peritoneum from the puncture in it and the rectus muscle downward to the side of the bladder, and back posteriorly to the round ligament near the uterus. In this almost circular sweep of the needle and thread the peritoneum is caught up about every third of an inch. When the suture is tied an antero-posterior partition of folded peritoneum is thrown between the iliac and bladder regions on each side. (Fig. 1.)

2. The round ligaments are fastened to the parietal peritoneum on each side from the internal inguinal rings to the artificial openings in the abdomen through which they are transfixed. The redundancy of the peritoneum and the loose attachment of the parietal peritoneum in these regions enable this part of the operation to be done with comparative ease, especially when the patient is in the Trendelenburg position.

The technique of the operation as I now perform it is briefly as follows:

Operation. Place the patient in the Trendelenburg position, make a median incision about three inches in length through the abdominal wall, the lower angle of which reaches the suprapubic fold, and dissect the fat and skin from the anterior sheath of the rectus muscle on either side of the abdominal incision, corresponding to its lower third. Pass two fingers of the left hand into the abdominal cavity on one side beneath the rectus muscle, already exposed anteriorly to locate and protect the bladder, then make a stab wound through the rectus muscle in the direction of its fibres into the abdominal cavity between the two fingers, an inch from the median incision and an inch and a half from the pubic bone. Before withdrawing the knife pass an artery forceps alongside of it into the peritoneal cavity, and with it seize hold of the round ligament and a portion of the broad ligament beneath it near the uterus. Now insert the suture (Fig. 1) which is to prevent the bowel from slipping between the uterus and bladder, or, for the same purpose, suture the round ligament to the parietal peritoneum, as already mentioned. Then drag the proximal end of the round ligament (Fig. 1) through the rectus muscle with the forceps already attached to it, and sew it and the subjacent portion of the broad ligament to the anterior sheath of the rectus muscle, leaving a stump of about half an inch long between the parietal peritoneum and the uterus. (Fig. 2.)

It must be remembered that the round ligament is a part of the broad ligament and in this operation it is not separated from it.

Deal with the other side in a similar manner, close the abdomen, and the operation is complete. (Fig. 3.)

In suturing the peritoneum, care must be taken not to leave an iota of raw surface in the peritoneal aspect; this prevents the possibility of adhesions of viscera to the abdominal scar. All that one has to remember to obtain this result is to evert the cut edges of the peritoneum and sew normal peritoneum to normal peritoneum behind the

Fig. 2.

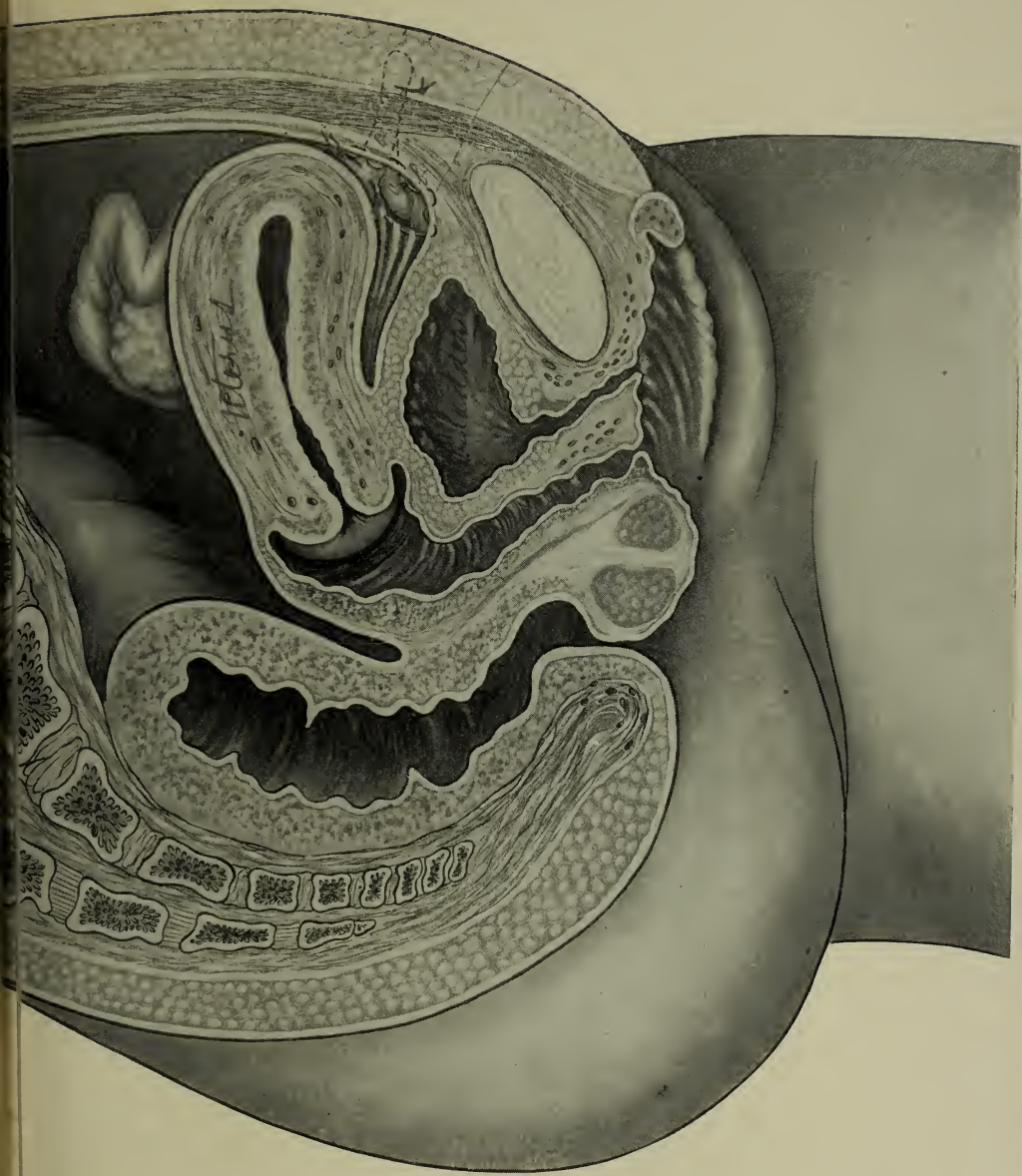
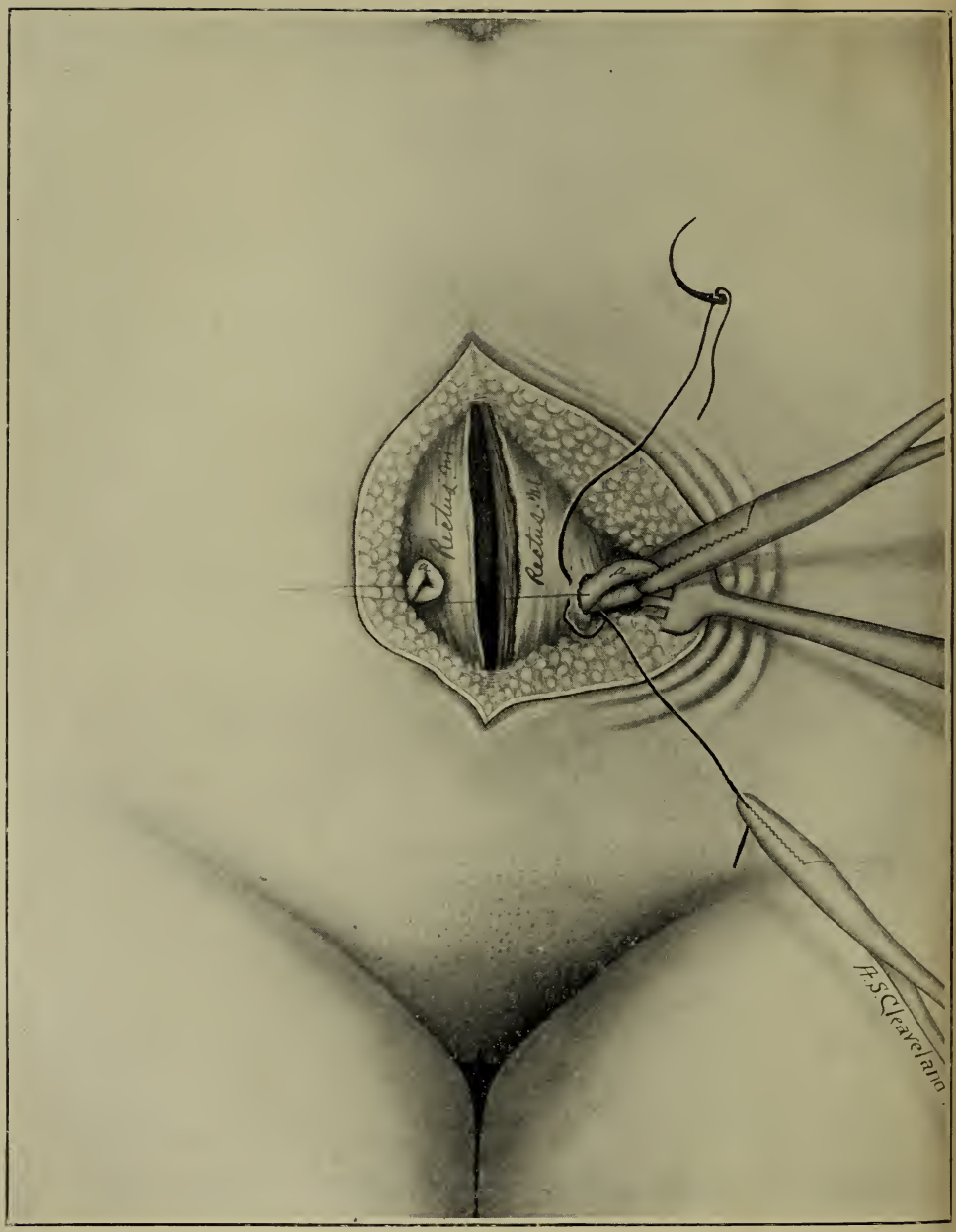


Fig. 3.



raw edges. A continuous suture of catgut does this most perfectly.

APPLICATIONS. 1. *Displacements*:

(*a*) Anterior.
(*b*) Posterior.
(*c*) Antero-lateral.
(*d*) Postero-lateral.
(*e*) Prolapse.

These malpositions include, of course, flexures as well as versions affecting the patient's health and that have resisted intelligent and appropriate non-operative treatment. It is admitted that the mere detection of a displacement giving no trouble to the patient is no indication for this or any operation. The abdomen should not be opened for displacements alone during the childbearing period, unless it is absolutely necessary for the relief of suffering or as an aid to conception.

2. *The operation is also applicable when the abdomen is opened for other purposes and the uterus is displaced.* Should, for instance, a section be made for diseased ovaries or tubes, or for myomata of the uterus, and at the same time a displacement exists, it adds but little additional risk to perform an anterior transplantation of the round ligaments for its rectification. The opportunity for doing this presents itself very frequently while operating on the gall-bladder, kidneys, appendix, between attacks of inflammation; hernia (inguinal, umbilical, or epigastric). I have in many instances of these conditions passed my hand through the primary incision into the pelvis and brought the round ligaments through stab wounds in the recti muscles, making the two skin wounds just long enough to enable me to suture the round ligaments to the anterior sheaths of the muscles, without opening the abdomen in the median line at all.

The hand in the pelvis, which does its work of protection and selection by its sense of feel alone, must needs have handled these structures many, many times before being

commissioned to so important a trust as is involved in this operation.

Since my operation was first published it has been accepted favorably by some of our best surgeons and gynecologists. Dr. C. A. L. Reed, in his *Text-book of Gynecology*, gives my operation prominent recognition. I have performed it over two hundred times without a death or complication except suppuration in the external wound in three cases. I have not followed all of them; but, as far as I know, there has been no return of the malposition of the uterus.

Advantages. Some of the advantages claimed for it are:

1. It is easy to perform, because all the structures involved are seen as well as handled while performing it.

2. The uterus is left free in the abdominal cavity, as no stitches or bands are attached to it.

3. There is no interference with the physiological functions of the organ—menstruation, conception, parturition, labor, or involution.

4. It has a wider range of application than any operation known to me.

INTRAMURAL EXTRAPERITONEAL ANCHORAGE OF THE ROUND LIGAMENT FOR POSTERIOR DISPLACEMENT OF THE UTERUS.

By George H. Noble, M.D.,
Atlanta, Ga.

Since doing my first operation for intramural extraperitoneal anchorage of the round ligament (April 6, 1893) my technique has been changed by using the transverse in place of the vertical incision, and thus fortifying the abdominal wound against the danger of hernia. It is this that I wish to show you.

The feature of the operation is the intramural extraperitoneal implantation of the round ligaments.

1. A transverse incision is made through the skin, fascia, fat, and aponeurosis down to the recti muscles. This incision, in the ordinary subject, should be about one and a half inches above the pubis and should extend laterally to the outer border of the recti. The recti are separated vertically in the median line and the peritoneum opened in the same direction. The pelvis is investigated, proper attention given to the local pathological conditions, and the uterus raised.

2. A pair of light compression forceps with teeth in the end (Senn's) is passed through the abdominal opening and grasps one of the round ligaments about the middle of its intraperitoneal portion. By traction on the forceps the uterus is pulled somewhat to the side of the pelvis which is opposite the ligament, held, the peritoneum is drawn away from the region of the internal abdominal ring, and the

ligament made taut so that it may be the more readily recognized in the extraperitoneal manipulations to follow.

3. Now just beyond the outer edge of the rectus, at the end of the transverse incision, the point of a pair of artery forceps is thrust through the posterior sheath of the muscles but does not enter the abdomen. The forceps is opened and withdrawn, so that an aperture large enough to admit the index finger is left. The finger is introduced through this opening in the preperitoneal fat, and feels the round ligament without difficulty, for it is brought into prominence by tension on the forceps which holds its uterine end. (Figs. 1 and 2.)

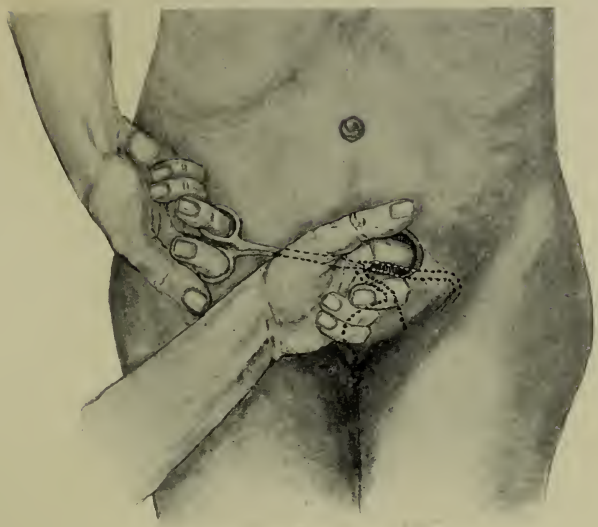
4. The finger, passed through the opening just described, is hooked under the extraperitoneal portion of the ligament from below upward, and draws it up into the wound. The sheath of the ligament is then split open by blunt dissection. (Fig. 3.) The sheath and the peritoneum are stripped back in the direction of the uterus, completely divesting the ligament of its covering. It is then drawn out of the wound, and forceps slipped underneath retains it until the opposite ligament is raised and denuded in the same way. (Fig. 3.) If the uterus has been in a state of marked retroversion, the ligaments will have become so attenuated as to allow their approximation in the median line in front of the recti, which approximation will restore the uterus to its normal position.

5. When it has been determined that the ligaments are long enough to meet in the median line they are each left looped over forceps while the peritoneum of the median incision and the recti muscles are closed with continuous kangaroo or catgut sutures.

6. The ligaments are next approximated in front of the recti and tied together. (Fig. 4.)

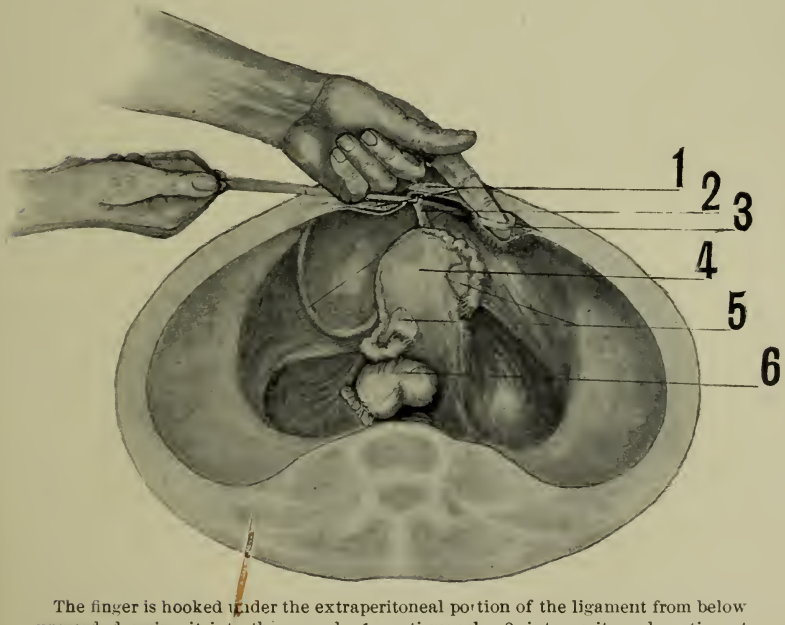
7. Now, beginning in one angle of the transverse incision, the cut edges of the aponeurosis are stitched together with a continuous kangaroo suture. When one or two loops of the suture have been passed, the needle, in crossing the

Fig. 1.



The finger is introduced through this opening in the preperitoneal fat and feels the round ligament without difficulty, for it is brought into prominence by tension on the forceps which holds its uterine end.

Fig. 2.

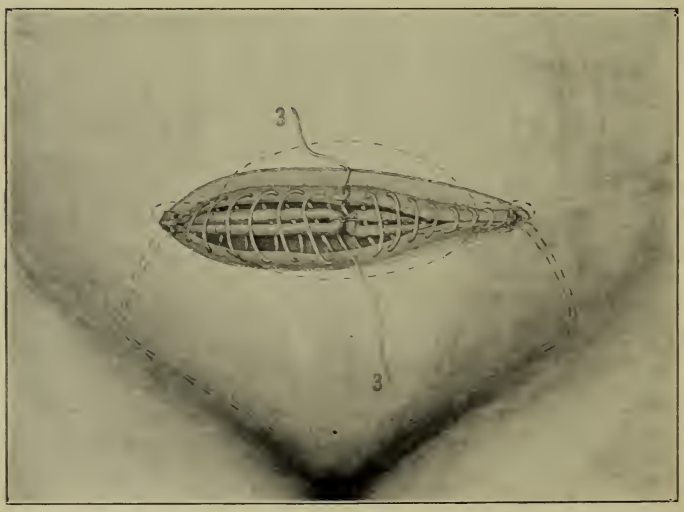


The finger is hooked under the extraperitoneal portion of the ligament from below upward, drawing it into the wound. 1, recti muscle; 2, intraperitoneal portion of the round ligament; 3, extraperitoneal portion of the round ligament; 4, uterus; 5, ovaries; 6, rectum.

Fig. 3.

The sheath of the muscle is then split open by blunt dissection, and forceps slipped underneath retains it until the opposite ligament is raised and denuded in the same way. 1, round ligament with covering : 2, round ligament with covering removed.

Fig. 4.



The ligaments are next approximated in front of the recti and tied together. Now, beginning in one angle of the transverse incision, the cut edges of the aponeurosis are stitched together with continuous kangaroo sutures, the loops of which are made to pass through the ligaments. 1, round ligament tied in the centre of the wound ; 2, aponeurosis ; 3, free ends of kangaroo sutures.

interval between the two edges, is made to pass through the ligament. It is well also to pick up a little of the muscle on each side of the ligament in order to provide against dead spaces. This process is continued as each successive loop is passed until the centre of the incision is reached, when the free end of the suture is clamped and left long. Starting in the other angle of the transverse incision (but looping in a contrary direction, so that when the two sutures meet their free ends may be on opposite sides of the wound), a second strand of kangaroo unites the edges of the aponeurosis on that side and picks up the round ligament and adjacent portions of the muscles as before. (Fig. 4.) The kangaroo tendons are tied together and the ligaments are thus embedded and firmly anchored between the aponeurosis and muscles.

8. The structures in front of the aponeurosis are closed in the usual manner.

If now the ligaments have not become stretched very much, or if the recti are very wide, or both, it will not be possible to bring the looped ends of the ligaments together. In this case they may be drawn up and carried mesad only so far as is necessary to replace the uterus, and moored as above; or they may be cut off at their distal ends, and their free extremities thus brought together or made to lap in the median line.

The ligaments thus embedded contract extensive adhesions with the aponeurosis and muscles—adhesions which are sufficiently strong to support the uterus after the sutures have been absorbed. Direct suturing to the aponeurosis attaches the ligaments to a tissue possessed of strength and elasticity—elements that are necessary for the ideal fixation of a support upon which the weight of the womb and the ever-varying degrees of intra-abdominal pressure are exerted. Supports attached to fixed points, such as bones or fascia, in close proximity to the same, receive the total effect of any force suddenly applied to the supported body, and in consequence often suffer injury on

the application of a force which would do them no harm were these points less firmly fixed. The aponeurosis is strong in texture, but yielding as a whole, in the area to which the ligaments are anchored, since its bony attachments are some distance away. Consequently the traction exerted upon the anchored ligaments, varying as it does with so many circumstances, is not borne entirely by them, but is participated in and modified by the elastic parietes of the abdomen.

In an article published in the *Atlanta Journal Record of Medicine* of October, 1899, and appearing in the TRANSACTIONS OF THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION, vol. xii., 1899, I reported a number of operations based upon the principles embodied in the present description. At that time, however, I used no transverse incision, but, having cut through the abdominal wall in a vertical direction, I dissected between the aponeurosis and muscle, opened the posterior sheath at the outer side of the rectus, raised the ligament and sutured it between the aponeurosis and rectus after the manner above outlined. The combined transverse and vertical incision renders the operation easier and lessens the liability to subsequent hernia.

When, in April, 1893, I first suspended the uterus in the way described, I waited almost three years before repeating the operation, preferring to discover if any disappointing symptoms should supervene rather than to proceed unguardedly with a multiplicity of cases. In this instance the woman had laborious domestic duties which put the method to a severe test, but with such a gratifying outcome that I began repeating it; and now, after a trial of several years, I employ no other procedure for anchoring the uterus, except when the saving of time is a consideration, or when such circumstances as removal of both appendages or the previous occurrence of the menopause warrant the simpler method of ventrosuspension.

I have now suspended the uterus by intramural anchorage

of the ligaments sixty-seven times. The cases thus treated embrace all degrees of retroversion and prolapsus; the patients represent all classes of society. I have followed carefully the twenty-three operations done in my private infirmary and most of those done in the Grady Hospital. I could not hope for more satisfactory results. In no case have there developed subsequent to the operation any unpleasant symptoms traceable to the method of suspension; in fact, in only a few instances were there any which might not follow any exploratory abdominal incision (slight infection in two cases). The relief of the annoying symptoms which warranted surgical intervention is prompt. The uterus remains high and freely movable.

The operation possesses many advantages over others designed to relieve the same conditions.

There is but one incision, through it any pelvic complication may be treated.

The weak distal end of the ligament is not depended upon for support, as in the operations of Alexander, Wylie, Emil Borde, Mann, and others; the portion utilized is the strong uterine end.

The operation is applicable to a greater number of cases than other round ligament operations.

It does not interfere with the normal mobility of the uterus or its physiological development during pregnancy.

It causes no vesical irritation or dysuria if the ligaments are not embedded too low down, and no dragging if they are not brought through too high up.

The anchorage is superior in permanency to all peritoneal attachments; the uterine portion of the ligament will not stretch away.

There are no sutures in the fundus to irritate the uterus.

The womb is not anteverted, as Emmet claims is done in the Alexander operation, but is suspended in the axis of the pelvic brim.

The fixation is extraperitoneal; no irritated point invites subsequent adhesions to the abdominal viscera.

The operation does not predispose to hernia, not infrequent after the Alexander operation; the round ligament does not pull open the internal abdominal ring by constant strain on its inner border.

There is no encroachment upon the bladder nor interference with its distention, as the round ligaments are drawn a very little nearer to the median line than normal.

Abnormal shortening of the ligaments does not occur; the "slack" only is taken up, and the ligament on each side restored to its natural length.

The round ligaments, therefore, accommodate themselves to the increasing size of the uterus in pregnancy, and subsequently undergo involution the same as the uterus.[1] In respect to this feature the ligament operation is particularly fortunate. The peritoneal bands or adhesions in ventrosuspension stretch in pregnancy, but do not reshorten or contract after labor.

In the ligament operation the peritoneal investment is not drawn into the abdominal walls, producing funnel-shaped depressions and inviting hernia—a criticism applicable to some other operations.

The danger of the operation is about on a par with exploratory abdominal incision. The separation of the peritoneum is not a serious question. The deep epigastric vessels are to be kept in mind. When the ligaments are being raised the operator's finger is to their inner side, and usually they are not seen. If they are drawn up with the ligament they can be recognized and separated from it.

[1] This is shown by a number of cases passing successfully through pregnancy and parturition.

INTRA-ABDOMINAL BUT RETROPERITONEAL SHORTENING AND ANTERIOR FIXATION OF THE ROUND LIGAMENTS FOR POSTERIOR UTERINE DISPLACEMENTS.

Being a Preliminary Report Concerning the Technique, with Report of Cases.

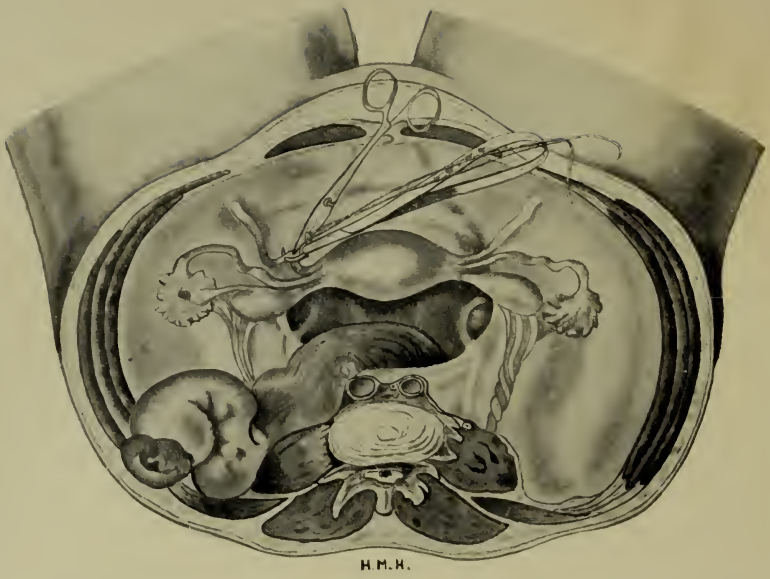
By F. F. Simpson, M.D.,
Pittsburg, Pa.

We are all agreed that many displacements of the uterus are transitory; that many cause no symptoms and require no treatment; that many yield to local treatment and pessaries, and that in many others, both simple and complicated, the foregoing measures utterly fail to give relief. You are all, of course, familiar with the evolution of this subject.

The speedy relief given these sufferers by simple operative measures led to the very general adoption of that mode of treatment. It soon became apparent that in fashioning a technique the operator should contemplate the fulfilment of the highest purpose of woman—maternity. The ingenuity of surgeons quickly met that demand, and ventrofixation gave way (except in a limited class of cases) to the methods of suspending the uterus from the anterior abdominal wall, as described by Drs. Kelly, Fowler, Martin, and others; to the various round ligament suspensions of Drs. Olshausen, Ferguson, Beck, Gilliam, Martin, and others; to the inguinal shortening of the round ligaments by the procedures of Drs. Alexander, Edebohls,

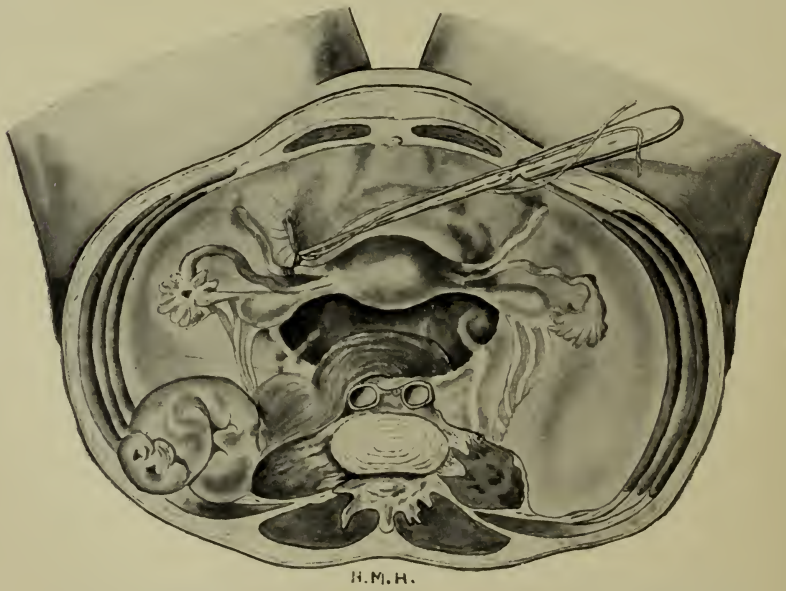
Martin, Goldspohn, and others; to the intra-abdominal shortening of the round ligaments according to the methods of Drs. Polk, Wylie, Dudley, Mann, Morris, Bissell, Baldy, and others; and to the several ways of shortening the round ligaments through the vagina, as advocated by Drs. Vineberg, Ries, and others. The advocates of many of the methods of shortening the round ligaments have insisted that not sufficient regard has been paid the structures other than the genital apparatus, normally found in the abdominal and pelvic cavities. To be highly successful any operative procedure designed to relieve displacements should at least take cognizance of the presence of the intestines and of the habits and accidents common to them. It has repeatedly been claimed, and with reason, that artificial bands stretched across the abdominal cavity invite strangulation of those viscera. This applies to ventrosuspension of the uterus, after which we get a suspensory ligament, and doubly so to the attachment of the round ligaments to the anterior abdominal wall according to the methods of Drs. Ferguson (1898), Beck, Gilliam, Martin, and others, for here we have two bands instead of one. This type of operation possesses a very positive advantage over other methods of shortening the round ligaments, viz., in changing their direction, thus increasing their retaining power. At first these objections were purely theoretical; but just as one case after another of dystocia following firm ventrofixation of the uterus was reported, until the epoch-making papers of Drs. Milainder and Noble defined the limits of that operation, so have cases of intestinal obstruction due to the suspensory ligament been creeping into the literature. True, but few accidents of this kind have been reported. True, that if they were far more numerous they would not counteract the sum total of good these operations have done by changing invalidism into countless years of happy and useful lives. But when Dr. Rufus B. Hall can relate three such cases from his own rich experience, and Jacobs and others can report like cases, we are constrained

Fig. 1.



The round ligament is grasped about one inch from the uterus, drawn up into the wound, and a silk ligature is inserted in such a way as to encircle about three-fourths of its thickness and to include about one inch of that structure in its grasp.

Fig. 2.



The carrier is then inserted and passed directly forward, immediately beneath the peritoneum of the vesico-uterine pouch, to a point on the anterior abdominal wall just above Poupart's ligament and an inch and a half to the side of the median line, where it again emerges.

to believe that the procedures which have been most widely applicable and most efficient with regard to the genital apparatus are seriously at fault by virtue of their disregard for the other abdominal viscera. In 1896 Dr. Noble was able to collect only eighteen cases of dystocia due to firm fixation of the uterus. To-day he could find record of many times that number. When a woman reaches the menopause that danger ceases; but when artificial suspensory bands stretch across the abdominal cavity, death alone frees her from the possibility of intestinal obstruction. Already ten cases of this kind have been reported. What may we reasonably expect in the future, when we recall that many afflicted with hernia do not become victims of strangulation until long after middle life ?

In common with most of you, I have for years wished for a procedure which would be as widely and easily applicable as ventrosuspension, and which would possess its good qualities without its objectionable features.

With the hope of stimulating continued thought along that line, I take the liberty of presenting for your criticism a preliminary report concerning the technique of a procedure which seems to me to meet our requirements, a procedure which I have employed three times within about a month and which I have not seen described. But utility and not originality leads me to burden the literature with one more method.

It consists essentially in changing the course of the round ligaments from a transverse to nearly an antero-posterior direction; in shortening the round ligaments so as to leave the weak part as slack, the strong part being used to control the movements of the uterus; finally, and especially, in effecting these changes beneath or by puckering the parietal peritoneum, thus leaving no bands of adhesion and no pockets which may strangulate an intestine. These principles have commended themselves to me as being mechanically and surgically correct. Varying details of technique will readily suggest themselves to the operator. The method

outlined below has been employed with the same ease and speed as an ordinary ventrosuspension.

1. Operations upon the lower genital tract, such as curetting, repair of the cervix, perineum, etc., are often required, the suspension being but a counterpart to the correction of other abnormalities.

2. A median abdominal incision one and a half to three inches long is made just above the symphysis.

3. Adhesions to the uterus are freed and lesions of the adnexa are given such attention as they require.

4. The wound is held wide open by one retractor, which is drawn straight up, thus making the opening vertical and permitting the operator to look far into the sides of the pelvic cavity.

5. The round ligament is grasped by a delicate forceps one inch from its uterine attachment and drawn up to the surface of the wound.

6. A silk suture is passed through the ligament at this point in such a way as to encircle about three-fourths of its circumference and to include about an inch of that structure in its grasp. (See Fig. 1.)

7. The needle is taken off and both ends of the suture are passed through the eye of a carrier.

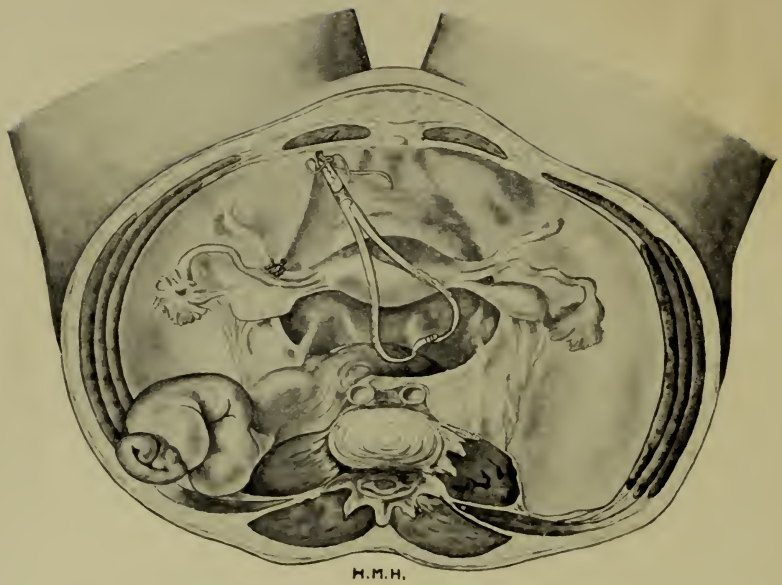
8. The peritoneum is incised just below and in front of the round ligament. The carrier is then inserted and passed directly forward immediately beneath the peritoneum of the vesico-uterine pouch to a point on the anterior abdominal wall just above Poupart's ligament and an inch and a half to the side of the median line, where it again emerges.

9. Both ends of the suture are grasped and the carrier is withdrawn. (See Fig. 2.)

10. One end of the suture is now threaded on a sharply curved needle which is passed into the abdominal wall, so as to grasp peritoneum, muscle, and fascia, again emerging into the cavity. (See Fig. 3.)

When the two ends of the suture are now tied the liga-

Fig. 3.



One end of the suture is now threaded on a sharply-curved needle, which is passed into the abdominal wall so as to grasp peritoneum, muscle, and fascia, again emerging into the cavity.

Fig. 4.

The peritoneum is thus folded loosely above the round ligaments, and when the sutures are tied the uterus is held in normal anteversion.

ment is drawn into and along the subperitoneal channel made by the carrier. Both round ligaments having been thus secured, the conditions existing are entirely analogous to those of an awning. The uterus represents the frame; the round ligaments and suture attached, the cords by which it is raised. That part of the abdominal wall caught in the grasp of the suture represents the pulley over which the awning-cord runs; and, finally, the peritoneum of the vesico-uterine pouch represents the covering of the awning. When the cords are tightened the uterus is raised just as an awning is. The peritoneum is thus folded loosely over the cords, and when the cords are tied the uterus is held in anteversion just as truly and securely as the frame of an awning is kept up after it has been raised and fastened. (See Fig. 4.)

Case I. Mrs. F., aged twenty-seven years, three children, youngest aged eighteen months. For several years has suffered from dragging pain in the back, oblique inguinal pains, etc., making her quite unequal to the task of caring for her household. This has been worse since the birth of her last child, and her discomfort is always intensified at her menstrual periods.

Examination disclosed lacerations of the cervix and perineum, with rectocele and cystocele, retroverted uterus, and a cystic tender ovary.

October 10, 1902, curetting and repair of the lacerations were done and the abdomen opened by a median abdominal incision an inch and a half long. The cystic ovary was resected and the uterus held forward by the technique above described except that, instead of burrowing beneath the peritoneum, it was picked up along the same course, much as one picks up the tissues in doing Emmet's perineorrhaphy. The peritoneum was thus puckered. She suffered no inconvenience when the bladder became distended. Examination three and a half weeks after operation showed the uterus in normal anteversion, with free lateral but limited backward motion. She ex-

pressed herself as being more comfortable than for several years.[1]

Case II. The second case is in every essential analogous to the foregoing except that her suffering had been more severe. She, too, was relieved, and the uterus was found in its proper position four weeks after operation, October 14, 1902.[2]

Case III. Miss S., aged thirty-nine years, a sufferer from retroversion. Her physician found that while she wore a pessary she was comfortable, but when it was removed the old trouble returned. He found it necessary to give her an anæsthetic each time the uterus was replaced and the pessary inserted. It was accordingly deemed advisable to replace the uterus and keep it in place by operative measures. In this case the technique was just as described above. While there had been no discomfort from the distention of the bladder in the other two cases, it was thought the puckering of the peritoneum might interfere with its function. In this case the same object was accomplished by tunnelling the peritoneum. (See Fig. 5.) The operation was done October 23, 1902. Examination November 11, 1902 (before the patient was out of bed), showed the uterus to be in normal position with the same mobility as in the other cases.[3]

The facility with which this operation has been done shows that its technical difficulties are few and easily overcome. Further, it possesses several distinct advantages. The change in direction of the ligaments increases their retaining power. Thus, a clothes-line sags between the posts; put it in the form of a swing, and the weight of a man will be easily sustained. A change in the direction of the round ligaments gives analogous results.

[1] Examined March 1, 1903. Pregnant two and one-half months; uterus in normal position.

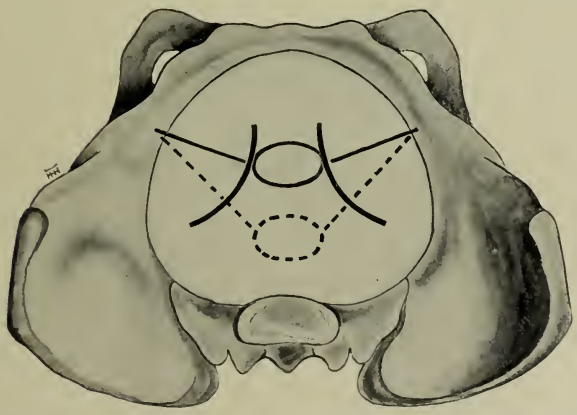
[2] Examination January 16, 1903, showed uterus in perfect position and symptoms much relieved.

[3] Examination January 15, 1903. Uterus in normal position without being rigidly fixed in one place. Backache relieved entirely. No menstrual pain since operation. Has gained fifteen pounds.

Fig. 5.

When the direction of the round ligaments is antero-posterior the stretching required to permit retroversion must be much greater.

Fig. 6.



When the direction of the ligaments is antero-posterior the stretching required to permit retroversion must be much greater than when the ligaments retain their natural course.

When the direction of the ligaments is antero-posterior the stretching required to permit retroversion must be much greater than when the ligaments retain their natural course. (See Figs. 5 and 6.)

As the new attachment of the round ligaments is on a lower level than the body of the uterus, these ligaments are not on such a constant strain as in most other procedures.

As the change in direction is effected beneath the peritoneum, there are no pockets in the peritoneal cavity, and no bands stretch across it, constantly inviting intestinal obstruction.

It is true that this procedure has not stood the test of time and pregnancy in my cases, but other similar methods of shortening the round ligaments have. This procedure, it seems to me, combines their advantages with those of being more widely applicable and free from the dangers of intestinal complications.

DISCUSSION ON THE PAPERS OF DRS. FERGUSON, NOBLE, AND SIMPSON.

Dr. Henry T. Byford, of Chicago.—With regard to the difference between the three operations just mentioned and the normal action of the round ligament, we must remember that nature has put two canals through the fascia already, and that these operations are putting other canals through. The supposed advantages of these new canals are the change in the direction in the first place; second, a more firm fixation. If I understand the change in direction, it is not only forward but more or less upward; therefore, the uterus is more or less suspended by the round ligaments. These are fastened there, so that there is very little play of the uterus, and the round ligaments must act as supports of the uterus against abdominal pressure. Such is not the function of the round ligaments, such was not so intended by nature, and they cannot normally be made to do so. The round ligaments are for the purpose of drawing the fundus of the uterus forward. If you hang the uterus up by the round ligaments you are doing an inefficient

operation. So I think it is a distinctly retrogressive movement to take from the inguinal canals the round ligaments and direct them into another channel where they have to directly support the uterus.

With regard to surgical procedures in these cases, it has been that we must not leave any peritoneal adhesions if we can get along without them; therefore, I suppose in the majority of cases it is inferred that we have no peritoneal adhesions. If there are no adhesions, it seems to me there is nothing more satisfactory than an operation similar to that which is performed by Alexander. The amount of traumatism and danger is less.

Even then we open the abdomen; we have other means which I think are better, because they are simpler, and hold the uterus in a more normal position. We can shorten the round ligaments, according to the A. P. Dudley or Mann method; and if the patient is a woman who is not to bear children we can make peritoneal adhesion of the uterus directly over the bladder. I often make a forward loop and stitch the loop to the anterior wall of the pelvis just behind, and a trifle above the level of, the external inguinal ring. If there is a lax peritoneum, such as we have in prolapse of the uterus, we cannot depend upon the round ligament to hold the prolapsed uterus. We want to draw up the whole connective tissue of the pelvis, as I have done in many cases, an operation which I described before the meeting of the last Pan-American Congress, held in Havana, Cuba.

Dr. Charles P. Noble, of Philadelphia.—It seems to me, before adopting new things we ought to consider what the old things do for us. There are two great groups of cases in which we bring the uterus forward by operation. The first great group is that in which there are no adhesions. In that group of cases for years I have done the Alexander operation, and my experience embraces somewhere about 150 cases. In my hands this operation is so nearly perfect that it would be extremely difficult to improve on it. So far as I know, there are two cases in which relapse has taken place; in other words, there is almost 100 per cent. of cures. I think it is impossible in surgery to get much better results than that, and, therefore, for the cases in which there are no adhesions the Alexander operation, as modified by opening the canal and fastening the ligaments by means of the Bassini operation, gives us all we

can hope for, so that from my standpoint there is not much field for new operations in this class of cases. The question, then, comes in regard to the class of cases in which there are adhesions. Of course, the experience of all of us is much larger in this group than it is in the other, because the cases are more numerous, and while I do not know how many such cases I have operated on, they certainly run into four or five hundred. In the old days, as alluded to by Dr. Simpson, when we did fixation we had trouble. Of my own work, there have been two Porro operations and quite a good many bad dystocias, so that I am in hearty accord with what the readers of the papers have said, namely, it is unjustifiable to do a fixation operation in a woman of child-bearing years.

So far as the suspension operation is concerned, I have been doing it since 1896, and in my own cases there has not been any trouble whatever from dystocia. I am told that there are a few cases on record of trouble after this operation, and that is easily explained by the fact that we cannot always exclude infection, and that, therefore, occasionally, although you think you have done a suspension, a little peritonitis will cause more extensive adhesion than was intended, and fixation is done instead. The percentage of cases in which this occurs is undoubtedly very small. So far as I know personally, there have been only one or two cases of dystocia, so the risk from that source, with the suspension operation, is not great. At present I find myself constantly doing suspension operations less than I formerly did in young women, and in this class of cases when I operate, where there are adhesions, I rely more and more upon the Mann operation, and, so far as my knowledge goes, in none of these has there been a relapse, so that practically the Mann operation has given me satisfactory results. From practical experience in dealing with six or seven hundred cases, these three procedures have met all the indications in women in the childbearing age. After that period there is no objection to the fixation operation, and particularly in cases of procidentia uteri I do a fixation operation. In cases where both appendages are removed for inflammatory conditions, it is my practice to take out the uterus. When you remove both appendages it is better to remove the uterus also than to leave it and hang it up by some supplementary operation.

Dr. Hermann J. Boldt, of New York City.—Some two or

three years ago an article appeared in one of the German medical journals in which the writer reported somewhere between two and three hundred cases upon which he had performed vesicovaginal fixation in retroverted and retroflexed uteri, wtihin a period of, I think, about two years. I came to the conclusion, which, as intelligent men, we must come to, that the indication was not strictly limited to the requirements of a surgical intervention. We must necessarily bear in mind that the main function of a surgeon is to place properly the indication for surgical intervention. We know that the majority of cases of movable retrodisplaced uteri, with flexion, can be treated by mechanical measures. It is my impression, from observation of patients upon whom surgical operations have been performed, that mechanical treatment has been lost sight of. There are patients who prefer surgical intervention to the use of pessaries, yet those are comparatively few in comparison with those women who prefer mechanical treatment. For those patients upon whom shortening of the round ligaments is to be done there is but one indication, and that is, when the uterus cannot be maintained in a physiological position by means of a pessary, where the body of the uterus will tip over the upper bar of any pessary which we may insert, in such instances shortening of the round ligaments is indicated. I take a more decided position than that which Dr. Noble has taken when he said that he does not think shortening of the round ligaments by means of the Alexander operation can be improved upon. I say most decidedly, that, in my opinion, there is no surgical procedure which can take the place of shortening of the round ligaments by means of the Alexander operation. There are no recurrences, as a rule. I do not know that I have seen more than one in a large series of cases where we have had a recurrence of the displacement. Hernia may be the only objection to the method, and that can be overcome, if no infection follows the operation, if the Bassini operation is made use of to close the wound.

Two gentlemen have spoken of treating the inflamed conditions of the tubes and ovaries through an inch or an inch and a half incision at the time when the operation is performed. So far as I am personally concerned, when adhesions exist to a sufficient degree to necessitate opening the abdomen, I have found it impracticable, if not impossible, to do my work through an inch-and-a-half incision. Adhesions which cannot

be broken up through such an incision can be broken up by the bimanual method of treatment, according to the method of Thure Brandt. When we have adhesions and pelvic inflammation, tubal or ovarian inflammation present as a complication, with the retroversion and flexion, then it becomes necessary to open the abdomen, and the incision should be sufficiently long for one to be able to see what he is doing rather than to feel, because hemorrhage from a torn adhesion is sometimes quite profuse. Furthermore, so far as surgical intervention in certain instances is concerned, I do not know that there can be improvement on the intraperitoneal shortening of the round ligaments as has been suggested and performed by both Dudley and Mann. I consider this about as good as any procedure. I have never seen an instance of procidentia of the uterus which was supported by shortening of the round ligaments.

Dr. M. C. McGannon, of Nashville.—I wish to preface my remarks by saying that in cases suitable for the Alexander operation, I decidedly approve of that method of shortening the round ligaments. I have had an experience in over 150 cases, and in my hands it has been eminently satisfactory. I wish to add six cases to those reported by Dr. Simpson by the new method he has just described.

A year and a half ago, in doing an operation for procidentia, I opened the abdomen and fixed the uterus forward by ventrosuspension, but, fearing it would not give me sufficient control, I shortened the round ligaments after the manner that has been described by Dr. Simpson. It was not original with me. I think I was really following the idea which Ferguson had given forth, but it was a modification. I will describe the method I adopted. [Here the speaker described by illustrations the method he had followed.] With the abdomen opened in the median line (and in these cases in which I have employed this method I was required to do something upon the structures inside the pelvic cavity), I grasped the round ligament at such a point as I thought would be proper in order to bring the uterus forward in its normal situation, made a little opening through the peritoneum at that point, and passed a No. 8 braided silk suture. With a pair of curved artery forceps I passed underneath the peritoneum at the border of the incision, carried out to the point where the broad ligament fastens through the abdominal wall, and along it to the little

opening. By grasping the ligature in those forceps we at once draw the ligament underneath the peritoneum to the opening. It can be done as easily and quickly as one can fasten the uterus forward in an ordinary ventrosuspension. Just pass an ordinary curved artery forceps underneath the peritoneum at that point (indicating), and draw it forward, as the ligament is folded upon itself, and it may be stitched to the muscle or fascia at the original point of opening, and as low down as you wish. You may descend just above the pubic bone or just as low as you desire. The ligament remains in a curved state, it does not come straight forward, as it is represented in this picture (referring to picture). It forms half of a circle, just as it does in ordinary instances. The only difference is, the point of attachment is in the centre of the line instead of midway on the ligament. The method has this advantage: There are no points left for adhesions to take place; the little opening in the peritoneum falls together, and leaves no place for adhesions to form. It is impossible for the bowel to become adherent at that point. Furthermore, it puckers the broad ligament. In cases of retrodisplacement of the uterus the broad ligament is stretched out. This method shortens the round ligament and holds the uterus in its normal position.

Dr. Edward McGuire, of Richmond, Va.—I have been much interested in the discussion of this subject. We have to bear in mind one thing, and that is, in all cases of posterior displacement of the uterus, especially in cases of retroversion of the uterus, the first step in it is descent of the uterus, and an operation that should be advised is one that will overcome this condition. It should take hold of the cervix and raise it to the normal level in the pelvis, keeping the cervix within an inch of the hollow of the sacrum, so that the fundus will take care of itself. I have had considerable experience with the various operations for holding the uterus in its proper position, and have limited myself to three—the Alexander operation, ventrosuspension, and the intra-abdominal shortening of the round ligaments after the Wylie-Mann method, as a rule, but only in a limited number of the latter. I use no particular operation, but an operation I think that suits the case. In cases of mild descent of the uterus which are associated with retroversion of the organ I use an operation that will lift the fundus the most; I use ventrosuspension. In all

cases of uncomplicated displacement of the uterus, so far as the ovaries and adhesions are concerned, I use the Alexander operation, and I do not believe it can be improved upon. I have never seen a case of hernia follow the Alexander operation; I have had one case of hernia in my series of ventro-suspensions, but it was a case in which I had to drain.

Dr. Bovée told me about an operation that he does, and I want to give him credit for it, as it is, to my mind, exceedingly ingenious. It is shortening the uterosacral ligaments, which accomplishes just the condition that I outlined just now. It raises the uterus to the level of the pelvis, and, at the same time, holds the cervix within a certain distance of the hollow of the sacrum. I have never performed the operation of shortening the uterosacral ligaments, but it appeals to me strongly, and I hope Dr. Bovée will give us his experience with it. I do not believe we ought to adopt any one operation, but should be governed according to the condition of the prolapse associated with the displacement, which should justify us in using one or the other operative procedure.

I am very much interested in the papers of Drs. Ferguson and Simpson, also in the operation described by Dr. Ferguson, as well as the old operation before he modified it, and I think in bad cases of prolapse of the uterus it might be done. The objection is that it makes three holes in the abdominal cavity, and it is more complicated than the other. It lifts the uterus to a higher level than the Alexander operation, and suspends it better.

Dr. A. Palmer Dudley, of New York City.—I desire to call the attention of the essayist to one point in which I am disappointed somewhat. We are here for the purpose of learning, and neither of them made any reference to the after-results in patients with reference to the different operations undertaken for the cure of the condition and the reflexes which follow. I myself have made the various operations, with the exception of Dr. Ferguson's and the last modification mentioned by Dr. McGannon, and I want to call attention to one fact (and, I presume, it is my privilege to criticise all of these methods as well as my own), and it is this: In doing these operations for the time being we allow ourselves to forget the dynamics of the pelvis. Be it understood that the pelvic floor is the lower diaphragm. We cannot confine it, and if the bladder is movable we cannot confine it, so that any one of the

operations that imprisons the bladder changes one pathological condition for another. The uterus lies in a position of anteversion of fifteen degrees; there is no space between the posterior wall of the bladder and the anterior surface of the uterus; they lie in that position. If we knuckle the round ligaments and draw them through under peritoneum by these methods of operation, the bladder distends laterally and pockets form anteriorily on each broad ligament. It forces its way up between the uterus and abdominal wall, and we get bladder distention or reflexes. It must be remembered that the round ligaments as they disappear through the abdominal walls into fascia are on a much lower level than the fundus of the uterus if it is in normal position. We must lift the body of the uterus into normal position, and not prevent the normal dynamics of the pelvis, namely, the up-and-down movement of the uterus without pain. I have abandoned the Alexander operation, because I am not satisfied in my own mind when I lift the uterus freely in the pelvic cavity and find it is freely movable that there is not some pathological change in the appendages, tube, or ovary which will necessitate after-treatment, and if we make the Alexander operation and draw the uterus forward, the tube is dependent; you put it on end more than it was with the uterus displaced, therefore you have a dependent tube with the fimbriated extremity down, you have the ligaments stretched in the Alexander operation, and traction against traction. I call attention to these two or three points, which should make us very careful how we substitute one operation for another or introduce an operation which may imprison those organs which are perfectly movable in the normal cases.

Dr. Ferguson (closing the discussion on his part).—I wish to say that "anterior transplantation of the round ligaments for displacements of the uterus" is gaining ground. The two modifications presented here to-day are rapidly on my trail, and they may supplant my method altogether. I am favorably impressed with both procedures.

As to whether the round ligaments support the uterus or not, I think that they act as guy ropes in pregnancy.

I have discarded the Alexander operation in the class of cases mentioned, and if any operator claims that he obtains perfect results by that method I would like to see his technique aud his cases afterward. To go into details concerning

the method I use in these cases would be to repeat what I have said in my paper.

I employ pessaries quite often. Every practitioner cannot apply them properly.

The method I have described does not confine the bladder at all. There are no pressure symptoms following the method.

I am going to try the two modifications that have been described, and for myself decide on their merits.

Dr. Noble (closing the discussion on his part).—There seems to be some misunderstanding as to the application of these operations. Some of the members have an idea that they are intended as a general panacea for all the ills of woman. Not a word was said about supporting the prolapsed uterus, or in cases in which the floor of the pelvis is destroyed, but simply backward displacement of the uterus. I stated that the operation was for cases with pathological conditions existing in the pelvis. I specifically stated that cases without pathological conditions should be treated by pessaries where patients will tolerate them. We can, therefore, eliminate a large part of the discussion as foreign to the subject.

Dr. Byford stated in drawing up the round ligament we shortened them or made them rigid. That is a mistake; on the contrary, I pick up the relaxed portion and do not shorten it beyond the normal, folding in only the excess of the ligament and avoid cutting it off when possible. It does not cramp or confine the bladder at all or cause dysuria. There is ample room for distention. I have tried numbers of operations, and now give this one my preference.

Dr. Byford stated that the function of the round ligament is to hold the fundus of the uterus forward. Well, that is all right, but they may be made to assist in holding the organ up. There is no objection to utilizing such a privilege, certainly no more than to the splitting of tendons and making them act upon the other toes or fingers.

In the main Dr. Boldt agrees with us in the application of the operation to these cases, but he objects to the length of the incision in dealing with adhesions. I have no objection to making a long incision, it is immaterial unless gross pathological conditions exist; then it may be necessary to open the abdomen freely.

In my operation the mesentery of the round ligament is not

drawn into the wound, making a funnel-shaped depression inviting hernia. Neither is there any liability to internal hernia from it, no loops are thrown across any part of the peritoneal cavity behind which the viscera may become incarcerated, nor is there any liability to hernia at the incision, as it is made in a manner that reinforces the wound. In transverse incisions the tendency is not to separate the edges of the aponeurosis, but to pull upon its ends or angles while the recti muscles add strength by crossing it perpendicularly.

Dr. Simpson (closing the discussion).—The gentlemen who have just preceded me have made it clear in their papers and in the discussion that the methods they describe for keeping the retroverted or flexed uterus in position are not applicable to all forms of displacements. So with the procedure I have submitted. In some cases no treatment is required, in others operations are unnecessary, while in others, still, many procedures are inadequate. Thus all methods of shortening the round ligaments are ineffective in cases of complete prolapse of the uterus, and ventrosuspension is equally unsatisfactory. Repair of the pelvic floor and firm fixation of the uterus are necessary to accomplish permanent results in this class of cases. We all meet with cases, however, in which it is necessary to open the abdominal cavity for other pathological conditions, such as the separation of adhesions, the resection or removal of bad ovaries or tubes, and in which retrodisplacements of the uterus are present. It is for such cases as these that the operations under discussion have been done. The methods of shortening the round ligaments within the abdominal cavity, such as folding the ligaments on themselves, I have seen tried a number of times. I have tried them myself in a few cases, but I must confess my results were not altogether satisfactory. There was recurrence when I tightened the round ligaments across the pelvis, and for that reason I was anxious to get better retaining force for these ligaments by changing their direction.

The point to which the round ligaments are attached in the procedure I have employed is not such as to suspend the uterus by these structures. The new attachment of the round ligament is made just half an inch above the spine of the pubes. It is, therefore, on a lower level than or quite as low as the plane of the fundus itself when in normal anteversion. This, with the antero-posterior direction of the ligaments, clearly

gives a decided mechanical advantage. In the cases under my care no disturbances of the bladder have been observed and I see no reason for even as much vesical irritability as is occasionally met with after ventrosuspension. It seems to me that the catheter is far more often the disturbing element.

NOTES ON THREE CASES OF INFECTION BY GAS-FORMING BACTERIA.

By Robert T. Morris, M.D.,
New York City.

The only three cases of wound infection from gas-forming bacteria that have occurred in my practice came closely together in a group. The patients were in three different hospitals, and consequently the occurrence is to be classed among the coincidences of practice rather than to any peculiar epidemic, apparently, although I heard of a number of similar cases at about the same time in New York.

The first patient, Mrs. E. C., aged forty-six years, was in excellent physical condition generally when I operated, on April 30, 1902, for the removal of a uterine myoma that was causing dysmenorrhœa and menorrhagia.

The operation was done quickly and easily, and consisted in removing all of the uterus, excepting a small part of the cervix, by the abdominal route.

On the following day the vital signs were practically normal, but there was a rather abundant bloody discharge from the vagina.

On the second day the pulse was 102, temperature 99.6°, and respirations 22 at the time of most marked disturbance. The bowel was distended with gas, and the patient complained of pain from this source, and was nauseated and vomited frequently. The bloody discharge continued as on the first day.

On the third day the pulse rate was greatly increased, without much change in the temperature and respiration. At this time, on examination of the abdominal wound, it was discovered that the skin of the right side of the abdomen looked puffy, and a subcutaneous crackling on pressure left no doubt as to the nature of the infection. The wound itself was healing by primary union, and there was no tenderness at any point in the pelvis further than the ordinary amount common after such an operation.

The symptoms continued practically unchanged until the seventh day, when the patient died. During this time the average disturbance of the vital signs was indicated by a temperature of 100° F., a pulse of 142, and a respiration rate of 24. There was much distention of the bowel with gas, the patient suffered from intense headache, and constantly vomited a watery fluid. The bloody discharge continued from the vagina. There was no suppuration, and the abdominal incision healed by primary union. An incision through the skin of the abdomen, made for the purpose of getting a culture of the bacteria, allowed the evacuation of a large quantity of gas from the subcutaneous tissues. The pathologist of the hospital happened to be away at the time that the specimen of serum was taken, and it was not preserved, because I expected to secure a fresh specimen on the following day, but the patient died during the night, and on the following day it was not thought that a specimen would be valuable.

My second case appeared on May 21, 1902, in a strong, robust man, J. S., aged thirty years, upon whom I operated for hydrocele by the method of opening the sac, swabbing it with pure carbolic acid, and neutralizing the carbolic acid with alcohol at the end of one minute. The wound was then closed with the exception of a small drain opening. On the following day it was noticed that the patient had a bloody discharge from the drain, and that the right side of the scrotum crackled on pressure. The scrotum became distended with gas, which gradually dis-

appeared during the following ten days. During this time the bloody discharge continued from the scrotum, the patient suffered from headache, which to him was an unusual thing, and his temperature averaged about 97.6° F., with a pulse rate of 78, and respiration at 18.

A culture taken from the fluid from the drain showed a pure culture of a bacillus that corresponded to the bacillus aerogenes capsulatus.

The wound healed slowly without suppuration at any time, and the bloody discharge from the wound gradually became pinkish.

The third case was in a youth, G. S., aged fifteen years. I saw him on July 1, 1902, and obtained the following history : Six days previously he had been thrown from his bicycle and sustained a compound fracture of the left forearm. On the fifth day the arm became greatly swollen, the temperature went to 104° F., and the pulse to 116, with respirations at 24. The fingers indicated gangrene. On the following day, when I first saw him, the gangrene was extending hour by hour toward the shoulder, and the entire arm, together with the pectoral region of that side, was greatly distended with gas. I believed that an operation would be useless, and advised against it in consultation; but on the day following it was decided to give the youth whatever chance might be offered by operation, and I made a rapid amputation at the shoulder-joint.

The patient began to improve after the operation, and went on to a good recovery. During the course of repair the wound discharged bloody fluid only, and did not suppurate. The bowel was distended with offensive gas, and the patient suffered from headache. In this case the disturbance of vital signs was shown chiefly in the temperature, which ranged about 103° F. for several days, with pulse and respiration keeping a proper average relation.

Five days after the operation a peculiar feature of a general erythema appeared in the form of large reddish blotches, most distinct upon the back. This gradually

subsided, and the cuticle separated from the region involved in erythema in large patches.

Specimens of serum from the wound, taken for culture purposes, were mismanaged, and as I did not look after the matter personally, the note on this point is not valuable for scientific record.

DISCUSSION.

Dr. Alexander Hugh Ferguson, of Chicago.—I would like to report two cases of gas bacillus infection in connection with the interesting cases detailed by Dr. Morris. The bacillus aerogenes capsulatus has its habitat in the soil, like the bacillus of tetanus, and is not unlike it microscopically. It is not a pyogenic organism, as shown by Welch and Nuttall, who have made most extensive experiments with it, and who, I believe, called it the gas bacillus. It is the bacillus emphysematosus later so-called by the Germans. It finds its way into the body on greens, cabbage, etc. One important point is to clean out the alimentary canal to get rid of it. Another point is that it finds its way into wounds from the finger-nails; hence the great importance of scrubbing the finger-nails. I think the only case I had came from that source; was either from my own nails or from those of my assistants. I did not use gloves at that time. This is one point in favor of rubber gloves. The case was one of tuberculosis of the glands of the neck, in which I closed the wounds without drainage. A fluid accumulation underneath the skin occurred; the emphysematous condition extended down to the chest, and the man died. The point I would impress is to clear out the alimentary canal and wear gloves.

Dr. J. Wesley Bovée, of Washington, D. C.—I have had three cases of gas bacillus infection, two of them following the removal of the appendages for pus. One of them died. Autopsy showed the gas bacillus in various portions through the viscera, and particularly in the liver and skin. One other case was for pus; the patient recovered, but in which was found the tubercle bacillus. I do not remember what the condition was in the other case. I was interested in the case that recovered with the presence of the tubercle bacillus and gas bacillus in the pyosalpinx. I received a letter from a physician

in Ireland, who was called to attend this servant girl over there, asking in regard to the conditions for which I had operated. I asked him to explain from what the patient was suffering, but received no reply, and therefore I cannot follow the case any further.

Dr. Carroll, who is a pathologist in Washington, associated with Dr. Reed in yellow fever work, and the cause of its propagation in Cuba, has studied this subject carefully, and has reported the cases I have mentioned already in the *Journal of Experimental Medicine*, in a paper which was read by him before the Johns Hopkins Medical Society.

Dr. Maurice H. Richardson, of Boston.—I have only a word or two to say in regard to this subject. It is one that interests the general surgeon as well as the gynecologist. The formation of gas in the tissues, especially in acute and chronic inflammations, is common. Whether this special bacillus spoken of is the cause of it or not, I do not know. In connection with cases of acute appendicitis, with abscess, the rule is for gas to be present in the collection of pus. It is often a cause for mistakes in diagnosis when gas is present in connection with the tumor of appendicitis. In acute infections connected with operations for hernia, and possibly in hydrocele, I have seen infection extend as high in one case as the axilla, in which the tissues were well filled with gas.

Dr. Hugh H. Young, of Baltimore.—While I am grateful to Dr. Morris for the honor he does me in calling upon me to discuss his paper, I must say that I am not prepared to do it justice. Dr. Ferguson does not, of course, mean that the work of Welch was of a later date than that of the German writers. Dr. Welch made public his discovery of the bacillus aerogenes capsulatus in 1891, and Fraenkel did not publish his work until 1893. His bacillus phlegmonis emphysematosum has been proved to be identical with Welch's previously described gas bacillus.

It has been demonstrated largely by Dr. Welch's students that this bacillus plays a very wide and important rôle, and it has now been found in infections of all portions of the body. One of the most important of these is the emphysema which quite frequently follows traumatisms, especially of the lower extremities, and its development after such injuries or operations should lead to an immediate search for a capsulated bacillus which does not decolorize by Gram, for these character-

istics are sufficient to warrant immediate operative interference—either extensive incisions, or amputation with subsequent bath treatment of the wounds.

The gas bacillus has frequently been found in the intestinal tract at autopsy, and a number of infections of the bladder and other pelvic and abdominal organs, where the bacilli probably came from the intestines, have been reported. I know of one case, operated for chronic appendicitis between attacks, in which extensive emphysema of the abdomen and chest followed soon after the operation and the patient died promptly. Gas bacilli, which were present in great number, probably came from the cæcum or stump of the appendix. Dr. Morris' paper is of much interest. In this connection I would refer to the recent exhaustive publication of Dr. Welch, which was reported in the *Johns Hopkins Hospital Bulletin*, September, 1900.

Dr. Morris (closing).—In regard to the remarks of Dr. Ferguson as to the source of the gas bacillus, it would seem that my three patients had been infected from active bacteria in the alimentary canal, from the fact that all of them were suffering from gas fermentation, so that it is not unlikely we had in these cases active colonies of proliferating bacilli of gas-forming species.

Dr. Richardson spoke of the fact of our having gas so frequently present in cases of appendicitis. That is very true, and that is why I called attention to the point that we have a number of gas-forming bacilli belonging to the colon group. It is necessary for us to make a more elaborate classification, to work out the different cases in such a way as to know whether the colon group forming gas in appendicitis cases are the same as the colon group forming gas that causes emphysema beneath the skin. We have a number of gas-forming bacilli, and it affords an opportunity for an interesting line of investigation in connection with this work.

PROLAPSE OF THE UTERUS.

By Charles R. Robins, M.D.,
Richmond, Va.

The proper answer to the many questions which arise in the consideration of this subject can be better rendered if we can discover a true answer to the query "How is the uterus normally maintained in its position?"

Taking up first the attachment of the uterus to contiguous structures we find that the uterine ligaments lie in a practically horizontal plane, that their attachments to the uterus are on about the same level with their attachments to the pelvic walls. It would appear, therefore, that they are in no sense suspensory, but that they must be and are designed for quite another purpose. This purpose is to prevent too great movement backward and laterally, and to maintain normal anteversion. They act as has been aptly said, as guy ropes.

Searching for further visible supports of the uterus, we find that it normally rests upon its attachment to the vagina and upon the fundus of the bladder. The supporting power of these structures is only slight, and is insufficient of itself. The slight resistance which both factors mentioned offer to descent of the uterus is clearly demonstrated by the ease with which the cervix may be drawn to the vulva by traction with a volsellum. We must, therefore, seek for other explanations of how the normal position is maintained.

The first explanation is found in the fact that no force is exerted under normal conditions in a downward direction

upon the uterus. Normally, the female pelvis is a closed cavity as practically as in the male. The perineum being drawn upward and forward against the anterior wall of the vagina, effectually closes the vaginal outlet. It is apparent, therefore, that, as long as the muscles controlling the perineum perform their functions, all the pelvic viscera are contained in what is practically a closed receptacle, and that any downward force is received principally on the bottom of this receptacle, and only slightly upon the contained viscera. When, however, these muscles are injured or their tonicity is lost, we no longer have a closed cavity. The uterus, vagina, and other viscera then become a part of the floor of the pelvis and receive the full force of the intra-abdominal pressure; their slight attachments are entirely inadequate for support, and descent is only a matter of time and circumstance. This principle is well illustrated by Penrose in his text-book. The pelvic contents being all of about the same specific gravity, are likened to water in a vessel. The pressure of the column of water above is received upon the bottom of the vessel. As long as the bottom is intact, pressure at any point in the vessel is the same in all directions. If, however, the bottom becomes perforated at any point, the column of water above is opposed only by the pressure of the atmosphere from below. In the case of the perineum and the uterus, when the perineum is ruptured, the vaginal tract becomes patulous, and the uterus is supported from below only by atmospheric pressure. Opposed to this is the force of gravity and intra-abdominal pressure, which, acting upon the uterus, which is in the line of pressure, causes descent. If, then, the supports are of such little consequence when the perineum is injured, how is it that they are sufficient under normal conditions? This is due to two reasons, the first one of which is that, normally, the uterus is of approximately the same density as the other organs contained in the pelvis. There is, therefore, no tendency for it to drop and thereby displace other organs which have the same density, and a

slight support is all that is necessary, and is sufficient. The second reason lies in its normal anteverted position. Intra-abdominal pressure is received upon the posterior aspect of the fundus and acts only to tilt it forward and not to push the organ downward.

The condition of the abdominal walls undoubtedly plays an important part in prolapse. When they are relaxed and in such a condition as to favor gastroptosis, they also favor prolapse; when they are firm and elastic they have a tendency to prevent it.

These, then, are the conditions which maintain the uterus at its normal plane: a perineum so supported by its muscles as to effectually lose the vaginal outlet, a uterus of normal density, the position of anteversion, and firm, elastic abdominal walls. These are named in the order of their importance. The failure of any one of them may cause a prolapse.

When, therefore, we come to consider the etiology of this complaint, we find that it involves one or more of these four points, and it is most frequent where several of them are involved. The only exception to this statement is when the uterus is forced downward by the growth of a tumor. This condition is obvious and does not come within the province of this paper. In those cases where prolapse occurs as the result of a sudden jar, severe strain, or coughing, the force is so sudden or so violent as to act before the perineum can contract, or it is able to overcome the strength of the perineum.

The etiology, therefore, is embraced principally in the following conditions: loss of the supporting power of the perineum, occasioned by laceration or by senile changes, or by general wasting and debilitating diseases; increase in the weight of the uterus occasioned by subinvolution, chronic metritis, or the development of tumor in the uterine wall; relaxation of the ligaments of the uterus, thereby permitting it to fall back into the axis of the vagina, occasioned by repeated pregnancies and debilitating diseases,

and present immediately after parturition; absorption of the connective tissue and fat of the pelvis, occurring as a result of disease or of old age; relaxation of the abdominal walls resulting from repeated pregnancies, general debility, or old age.

There are certain changes associated with or consequent upon prolapse that must also be considered.

Prolapse of the vagina, occasioned by impairment of the supporting power of the perineum; this is associated with a simultaneous beginning descent of the uterus, but if the uterine ligaments approximate a normal tone, the uterus is arrested after it has reached a point where the ligaments become suspensory. The vagina, however, continues to descend, and, by making constant traction, draws out that portion of the cervix between the attachment of the vagina below and the ligaments above, and we have the condition known as elongation of the supravaginal cervix. This elongation may result in increasing the depth of the uterus to seven or eight inches.

If, however, the relaxation of the ligaments is so great as to oppose no barrier to descent, the fundus follows the cervix until it eventually may lie entirely outside of the body. Hypertrophy of the cervix is most marked in those cases where there is elongation of the supravaginal cervix and is due to passive congestion from interference with the blood supply.

Subinvolution of the uterus is present and is commonly marked.

Rectocele and cystocele are consequent upon the prolapse of the vagina.

Attenuation of the uterine ligament is a necessary sequence and is most marked when the fundus has descended outside of the body.

Stretching of the vagina and the vaginal outlet and the atrophy of the structures of the perineum are occasioned by the presence of the enlarged uterus, and offer the most serious obstacles to obtaining a permanent cure.

Treatment. This, then is the clinical and pathological picture present in these distressing cases. Successful treatment must take into account each one of the pathological conditions and offer some plan by which they may be corrected.

Those changes due to abnormal position and traction should receive first attention. It is essential that these should be met by the proper preliminary treatment and the parts brought to a condition as near normal as possible. It is only in this way that we can properly estimate what operative procedures are necessary and secure the best results.

When the patient first presents herself, as a rule, all pathological changes are accentuated by her having been endeavoring to be about. The first and most important measure is absolute recumbent posture in bed. To this should be added certain regulations. The uterus should be reduced with the patient in the knee-chest posture. The bowels should be kept open with laxatives and enemas to prevent straining. As often as prolapse recurs it should be immediately reduced. The patient should be put in the knee-chest posture several times daily, with the perineum retracted to maintain the uterus in its normal position. These measures relieve traction and passive congestion. They should be supplemented by the administration, three or four times daily, of copious hot vaginal douches, which, in case of leucorrhœa or ulceration, should be made slightly antiseptic, otherwise they should be of normal salt solution. The stimulation to the circulation thus secured has a pronounced effect in relieving congestion and imparting tone to the parts. This treatment should be continued for a period of from three to six weeks, at the end of which time a most marked change will usually be observed. The swelling and congestion of the cervix will, to a great extent, have disappeared, the elongated cervix will have approached normal, the uterine ligaments will have taken on new tone, the vagina will be diminished in calibre, and the outlet will gap less. The shorter the duration of the case and the younger the patient, the more marked will be the improve-

ment, as the atrophy of muscular tissue and attenuation of the ligaments will not be so advanced. Operative treatment which shall then be found necessary should be directed to the following points: restoration of function of the perineum, reduction of the uterus to its approximate weight, cure of cystocele, and maintenance of the uterus in an anteverted position.

The uterus should receive first attention. If it still remains enlarged and of increased weight this must be corrected. Prolapse is not uncommonly complicated by laceration of the cervix, which entails induration and the formation of new connective tissue and the condition commonly known as cystic degeneration. These changes may likewise be brought about by traction and elongation of the supravaginal cervix. Subinvolution of the fundus is also usually present, as is endometritis. To correct all of these curettement of the uterus and amputation of the cervix, high up, if necessary, are the most rational and certain procedures. The permanently damaged cervical tissue is at once removed and involution of the uterus is promoted.

If the cystocele is slight, proper repair of the perineum will be all that is necessary. If it is at all pronounced, Sims' operation, which consists of the denudation of two strips on the anterior wall, and their approximation by sutures, should be practised.

Restoration of the perineum is best accomplished in recent cases by Emmet's operation and, indeed, the prompt performance of this operation as soon as the need for it is discovered, is the greatest prophylactic measure that can be undertaken for the prevention of prolapse. In cases of long standing or advanced age, where there is marked atrophy of the perineal structures, Hegar's operation may be better.

We have now left only one indication, maintenance of the uterus in its normal condition of anteversion. Ventrosuspension is the operation most commonly used for this purpose, but the point is to place the uterus in such a position that its axis will be at right angles to that of the vagina,

and intra-abdominal pressure will be received upon its posterior aspect. The value of anteversion in preventing prolapse may be easily demonstrated. If a patient with a freely movable uterus in the first degree of retroversion, and with a lacerated perineum, is examined and directed to strain down, it will be observed that with each effort the cervix is driven toward the vaginal outlet, sometimes so far as to be visible. If the uterus is reduced to anteversion, the same efforts will cause no appreciable descent. Fixation of the uterus to the anterior abdominal wall should not be practised for the purpose of so securing the uterus as to prevent descent, because if the other elements for the support of the uterus are lacking, it is readily apparent that the same forces that are capable of drawing out the uterus for several inches will be sufficient to draw out the attachment to the anterior wall, so that prolapse will recur.

There are two conclusions that I wish to emphasize: first, the value and the necessity of preliminary treatment before operation is undertaken, and second, that prolapse involves several important factors, and that each one that is involved must be adequately met by the operations performed. The combination outlined, while not new, will be found effective in most cases and should always be tried. Their virtue does not lie in any one procedure but in the proper combination. When successful the patient is not only cured, but is restored to her normal condition and is capable of exercising her normal functions.

In certain cases there may be relapse. This will be most likely to happen where there is marked atrophy of the perineal muscles and attenuation of the uterine ligaments. In such cases hysterectomy may be forced upon us, but that of itself is not sufficient. The uterus is the most obvious organ which prolapses, but all of the pelvic organs are involved, and will continue to prolapse unless some provision is made to prevent them. In these desperate cases the operation recently suggested by Edebohls would seem

to be the only one to meet the indications and is called by him "panhysterocolpectomy." It consists essentially of drawing the uterus out until the vagina is completely everted, in making a circular incision around the base of the vaginal cone thus made, and dissecting it off from subjacent tissues, and then removing the uterus with the vagina. The tissue at the apex of the cone is gathered in a purse-string suture and tied. Another purse-string suture is inserted higher up and tied after the tissue below has been inverted. This process is continued until the vagina is completely obliterated. The tissue thus inverted and sutured forms an excellent support for the pelvic organs and further prolapse is impossible. The objections to the operation are obvious, and it should only be undertaken in desperate cases when all other means have failed.

I wish to report a case which is instructive in this connection, as it involves cure of complete prolapse and restoration of function:

Mrs. H. G., white, aged thirty-one years, married, was seen in July, 1898, and gave the following history: father died at the age of fifty-six years of paralysis, mother at forty-three years of tuberculosis; one brother and three sisters living, one sister died of tuberculosis.

Personal History. Was sickly as a child. At six years had scarlet fever, followed by disease of a rib; rib afterward worked out of side. Menstruated at fifteen years; suffered considerably at onset of period, but last days were painless. Married first time at eighteen years; had three children. Had convulsions with first child, and child was born during convulsion. No complication with birth of other two children. Married second time at twenty-four years, and has had three children.

History and Symptoms of Present Illness. Present illness dates from first child by second marriage, three years ago. Had rapid delivery by forceps and was violently torn. As soon as she got up, suffered with considerable swelling of parts. Has suffered ever since and can hardly get about.

Has had two children subsequently. Womb has been coming out for last twelve months. Suffers a great deal, has backache, headache, pains in her legs, is very cross, and feels at times as if she would lose her mind. Exercise makes her much worse and she is hardly able to walk about.

Physical Examination. Tumor protruding from vulva consisting of uterus and everted vagina. Fundus just within the vaginal outlet. Vaginal mucous membrane changed from exposure. Marked laceration of perineum. Cervix enlarged and uterus in a condition of pronounced subinvolution. Depth of uterus five inches.

As the patient could not be admitted to the hospital at this time, she was put upon the preliminary treatment outlined and admitted to the Old Dominion Hospital, August 8, 1898. I endeavored then to have a photograph taken of the case, but found that the tissues had so far regained their tone that I was only able to draw the cervix slightly beyond the outlet, even when making severe traction with a volsellum.

On August 10th I did a curettement, amputation of the cervix, and Emmet's perineorrhaphy. On August 16th I did a ventrosuspension, using absorbable sutures. The patient made an uneventful recovery. She subsequently became pregnant, and on July 28, 1900, was delivered of a full-term child. The patient spoke of her labor as the easiest one she had ever had. No injury of the soft parts was sustained, and one year after she was in robust health, attending to her household duties, and having had no evidence of a return of the prolapse.

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DISCUSSION.

Dr. Hermann J. Boldt, of New York City.—I can add very little to what the essayist has already said, except to call attention to one method of treatment which seems to have been forgotten, and which I had an opportunity to study some ten years ago under Thure Brandt, and that is mechanical lifting of the uterus. I have watched a number of patients whom Thure Brandt and his former assistants treated, in Christiana, and I watched quite a number of patients when I returned from abroad, and I must say that there is no method of palliative treatment which will so positively temporarily keep the uterus up from becoming prolapsed as the mechanical lifting of this organ by means of the hands, according to the method of Thure Brandt. It is a method which will afford relief; it can be readily employed, and will give results. Of course, it will not keep the uterus in position permanently, as Thure Brandt maintains, neither will it have any effect upon procidentia of the vagina or on hypertrophy of the cervix, which we usually find. But as a palliative method I can strongly recommend it.

DISEASES OF THE RIBS FOLLOWING TYPHOID FEVER.

By J. Shelton Horsley, M.D.,
El Paso, Texas.

Mr. C. B. M., Parral, Mexico, aged forty-two years, mining engineer, American. Family history negative; previous health excellent, except a severe attack of typhoid fever in the fall of 1900. A few weeks after convalescence had been fully established, pain and swelling occurred in the left side of the thorax, over the anterior end of the sixth rib and costal cartilage. Pus formed and was evacuated by an incision. A sinus resulted, which a few months later was opened and curetted, but did not heal. He came under my care June 14, 1901. The patient was apparently very robust. There was a sinus opening at the centre of the sixth costal cartilage on the left side which discharged in the course of twenty-four hours about half an ounce of thick, tenacious, odorless pus. A probe would follow the costal cartilage to the sternum, and could be introduced for 5 cm. in the other direction toward the rib, but no bare bone was detected. A rather imperfect examination of the pus showed a bacillus thought to be that of Eberth; no cocci or other bacteria were found. Operation at St. Luke's Hospital, June 15, 1901, under chloroform. A 12 cm. incision was made over the sixth rib and cartilage, commencing at the sternum. All of the sixth costal cartilage was removed, most of the seventh, and part of the sternum. The perichondrium was curetted, care being taken to avoid injuring the internal mammary artery. The old sinus tract

Case of disease of ri ls after typhoid.

in the soft parts was cut away, the wound packed with iodoform gauze, and the skin partly approximated with silkworm-gut. He fully recovered from the immediate effects of operation; temperature only reached 100° F. once. The wound, however, did not close, and the patient left the hospital on July 14th, with a sinus still discharging pus, though not so much as previous to operation. He was re-admitted two weeks later, and operated on again under chloroform, on August 11th. A more extensive incision was made than at the previous operation, but in the same direction, following the line of the sixth costal cartilage and rib. Some cartilage had re-formed, and this, together with all of the seventh costal cartilage and adjoining portion of the sternum as far as the middle line, was removed. Then 5 cm. of the sixth rib were resected, though apparently only 1 cm. was diseased. As the pleura was not diseased or thickened at this point, and would bulge out at each expiration, care was required to avoid injuring it. The wound was treated as after the former operation. He suffered a great deal from pleurisy for five days, and was not completely relieved by strapping the chest. Otherwise convalescence was uneventful. Patient left the hospital September 1st, with a sinus discharging a small amount of sero-pus. Healing, though slow, was uninterrupted, and on October 10, 1901, the sinus closed. There has been no tendency to recurrence, and when last heard from (September, 1902) he was perfectly well.

Diseases of bones following typhoid fever are interesting from several standpoints, particularly from that of time of occurrence. Post-typhoid osseous lesions may arise at any time, either during the attack of fever, or from a few weeks to months, or even years, after convalescence from the fever. This is due to the peculiar vitality of the bacillus of Eberth. Schiller (*Arbeit. kaiserlich. Gesundheitsamte*, vol. v. p. 312) implanted the bacilli on silk threads, and found them alive and active from one to two years afterward. He asserts that they can live on potato culture

for two years. Within the body their length of life is even more remarkable. Von Dungern (*Munch. med. Wochen.*, 1897, No. 26, p. 699; Keen's *Surgical Complications and Sequels of Typhoid Fever*, p. 250) reports an instance in the case of a woman, aged forty-six years, who was ill from typhoid fever four weeks in November, 1882. After a number of attacks of various kinds, such as gastralgia, periostitis of the lower jaw, etc., a tumor formed in the region of the gall-bladder in October, 1896. This was accompanied by pain and occasional chills. By February, 1897, the tumor had enlarged to the size of a child's head and was opened, 150 c.c. of pus being evacuated. Careful examination showed the presence of typhoid bacilli in pure culture. Buschke (*Lebensdauer d. Typhusbacillen in ostitischen, Herden Fortschritte d. Med.*, 1894, p. 573; Keen's *Surgical Complications and Sequels of Typhoid*, p. 20) reports the case of a woman of sixty-six years who had typhoid fever in 1886. Without any evidence of another attack, a swelling in the axilla was incised February, 1894, and pus containing a pure culture of typhoid bacilli evacuated.

Another remarkable fact is the length of time discharge from an open sinus due to diseased bone will show a pure culture of typhoid bacilli. G. Sultan records a case in which a sinus existed for six years, after which time the pus showed a pure culture of the bacillus of Eberth (Case No. 15 in table).

It was at first supposed that the infection was always mixed with the staphylococcus pyogenes, eventually showing pure culture of typhoid, owing to the great vitality of the bacillus. The bacillus of typhoid fever is now admitted to be pyogenic on occasions, and the experiments of Dehu, Vincent, Vaillard and Dmochowski, and Janowski (Keen's *Surgical Complications of Typhoid Fever*, p. 113) demonstrate that the viability of the staphylococcus is even greater than that of the typhoid bacillus. Consequently, when a pure culture of the typhoid bacillus is found, it is

unlikely that the staphylococcus pyogenes was ever present. There are five peculiarities that appear to differentiate post-typhoid disease of the ribs from similar disease of other bones:

1. The marrow of the ribs seems to be a particularly favorite seat of the bacillus in a patient convalescing from typhoid. This fact indicates a lower resistance in the ribs than in other bones. A number of observers have found the bacilli in bone marrow, where they have remained for some time without producing disease. Quincke (*Berlin. klin. Wochen.*, 1894, No. 15) in nine post-mortems found the bacillus eight times in the marrow of the ribs and once in the bones of the extremities.

2. The position of the ribs being superficial, their movement in respiration practically continuous, and several being subjected to the constant impact of the heart's action, would make a locus minoris resistentiæ more liable to occur here than in other bones.

3. Paget (*St. Bartholomew's Hospital Reports*, 1876) asserts that, though there is rarely necrosis of the costal cartilages, necrosis of the ribs never occurs. Clinical reports do not bear out this assertion, but it is true that necrosis occurs less frequently in the ribs than in other bones—a fact which tends to separate disease of the ribs from similar affections of other bones where necrosis is more common.

4. Post-typhoid disease of the ribs occurs very largely in later life. Keen (*Surgical Complications of Typhoid Fever*, p. 137) says that of thirty-two cases in his table the age is given in eighteen; five were from twenty to thirty years of age; six from thirty to forty, and seven over forty. In a lecture before the German Society of Naturalists, Helferich (*Berl. klin. Wochen.*, 1890, vol. xxvii. p. 979), after asserting that the disease is the direct result of typhoid bacilli, says that it is mostly observed in advanced age (from thirty-one to sixty-three years, in his series of eight cases) and thinks this peculiarity is due to changes in the

costal cartilage from age, as vascularization, breaking of fibres in the intercellular substance, etc.

5. The difficulty of thoroughness in operative treatment is most pronounced in the ribs. Unlike cases of osteomyelitis from empyema or pneumonia, the pleura is usually but slightly thickened, and is frequently normal. Consequently, it is very readily wounded. Even when it is not there is liability to pleurisy, as occurred in the writer's case. The proximity of the pericardium and, in the lower ribs, of the diaphragm, may also deter the operator from thorough work in these localities.

This difficulty is well illustrated by the fact that each of the two cases of post-typhoid disease of the ribs reported by Parsons (*Johns Hopkins Hospital Reports*, 1895, vol. v. p. 417) as having been surgically treated at Johns Hopkins Hospital during the year immediately preceding his report had to be operated upon twice before a cure was effected. The case of Keen (*Surgical Complications of Typhoid Fever*, p. 129) is also in point. The patient developed disease of the right sixth and seventh costal cartilages following typhoid fever. An incision was made, which gradually closed, but the swelling continued. About sixteen years later, in July, 1894, the tumor over the affected ribs was incised by Dr. Rice, and part of one rib removed. The operation resulted in a sinus which never closed. A second operation was done in October, 1894. In January, 1895, the wound having never healed, the patient was operated on at the Pennsylvania Hospital by Dr. T. G. Morton, who removed a portion of the sternum and parts of some ribs, but without effecting a cure. February 20, 1895, Dr. Keen did an extensive flap operation, removing between three and four inches of the fifth, sixth, and seventh ribs, which were found softened from osteomyelitis. The wound healed entirely, but later reopened and a sinus leading to the sternum resulted. March 25, 1896, Dr. Keen again operated, removing more diseased bone. Healing was very slow, but finally complete.

The symptoms and signs of disease of the ribs following typhoid fever are much the same as in disease from other causes, with the exceptions that the bacillus of typhoid is frequently found and that the disease rarely, if ever, affects the patient's constitution, which is in great contrast to similar lesions produced by tuberculosis, pneumonia, or trauma. The temperature and pulse are not raised, though there may be free suppuration. In the case reported at the beginning of this paper the patient's general health was not impaired, though disease of cartilages, ribs, and sternum were quite extensive.

Post-typhoid lesions of the ribs and sternum must be more frequent than the number of fully reported cases seems to indicate. Helferich (*Berl. klin. Wochen.*, October 20, 1890, p. 979) states that he has seen eight cases in five years. Berg, a Scandinavian physician, has had seven cases in his own practice (*Central. f. Chirurgie*, 1896, p. 153). Meacham (Paget's *Surgery of the Chest*, 1896) saw four cases in the course of a single year's work. Though many reports like Helferich's, Berg's, and Meacham's are in such a fragmentary state that they cannot be used for tabulation, every effort has been put forth to make the following table contain all reported cases where sufficient data are given:

TABLE OF DISEASES OF THE RIBS FOLLOWING TYPHOID FEVER.

No. of case.	Operator and reference.	Sex and age.	Ribs affected.	Kind of diseases.	Time of appearance.	Treatment and remarks.
1	A. S. Grimm. Med. Record, New York, 1895, vol. xlviii. p. 381.	Male.	5th, 6th, and 7th ribs; side not given.	Periostitis.	Pain and redness over 6th rib in third week of fever; fluctuation about three months after recovery; pus evacuated and sinus resulted. Bacillus of Eberth found.	Radical operation a year after abscess was lanced; 6th rib partly removed; 5th and 7th curetted. Slow but complete recovery.
2	Richard Lampe. Deut. Zeitschrift f. Chir. Leipzig, 1899, p. 603.	Male, young.	5th, 6th, and 7th ribs and costal cartilages on left side.	Perichondritis and chondritis.	Was never free from pain in chest after fever; swelling appeared four months after recovery.	Resection of 5th, 6th, and 7th cartilages; perfect recovery. Typhoid bacillus found.
3	J. C. Willson. Med. and Surg. Rep., Phila., 1891, vol. lxiv. p. 733.	Male, 32	6th rib, right side, at junction with cartilage.	Caries, chiefly of cartilage.	About a year after recovery from typhoid.	Operation refused. Injection of methyl-violet every three or four days. Cure.
4	S. O. Lewis Potter. Pacific Med. Journ. San Francisco, 1889, vol. xxxii. p. 593.	Male, druggist.	Swelling over right side of sternum below left nipple, and one over 3d right rib and over 5th, 7th, and 8th ribs.	Periostitis.	About four or five months after recovery from typhoid.	Swellings incised; only dark blood evacuated; iodide of iron and manganese given. Improved, but not cured.
5	S. O. Lewis Potter. Ibid.	Male, preacher.	A large swelling over ribs; no details.	Necrosis of ribs.	.....	Excision of diseased ribs performed twice without recovery; in both this and the preceding case, large doses of antifibrin had been given during the attack of typhoid.
6	S. O. Lewis Potter. Ibid.	Male.	Left lower ribs.	Necrosis.	Soon after recovery from typhoid.	Operated upon several times with improvement but not cure; excision of diseased bone.
7	Rep. by Albertine. Operator, Maurice Pollosson. La Prov. Méd., Lyon, 1895, vol. ix. p. 173.	Female, 29	Anterior extremity of 7th rib, right side.	Osteomyelitis.	Tumor appeared about two months after recovery from typhoid.	Incision and curettement; end of rib contained a cavity lined with fungoid granulations. Cure.

8	Rep. by Albertine. Ibid.	Male, 35	Anterior end of 6th rib, right side.	Osteomyelitis.	Pain commenced fifteen days after cessation of fever; about two months later on acute abscess formed and broke, leaving a sinus.	Operation about three weeks after sinus formed; bone cavity in end of 6th rib curetted; sinus still remained
9	Rep. by Albertine. Ibid.	Male, 56	6th and 7th ribs, left side.	Osteomyelitis.	Had pain in 6th and 7th ribs during fever; about three months later an abscess formed and left a sinus which was operated on eighteen months later.	Curettement of anterior extremity of 6th rib, which contained a cavity; affection called "costal medullitis of typhoid nature." Wound was healing nicely when case was reported.
10	Rep. by Albertine. Ibid.	Male, 42	5th rib, right side and adjoining portion of sternum.	Osteomyelitis.	One month after onset of fever pain was noted on right side of sternum; in ten days there was local swelling, and three months later an abscess formed and broke, leaving a sinus.	A cavity was found in sternum at insertion of 5th costal cartilage, on right side; curetted. Complete cure.
11	Rep. by Albertine. Oper. Jaboulay. Ibid.	Male, 40	6th rib, right side.	Osteomyelitis.	Swelling appeared during convalescence; abscess formed and broke, leaving a sinus.	Operation about six months after inception of fever: curettement and removal of a portion of 6th rib. Cure after long convalescence.
12	Rep. by Albertine. Oper. Terrier. Ibid.	Male, 29	7th and 8th ribs, left side, their costal cartilages and adjoining portion of sternum.	Osteomyelitis, with arthritis and necrosis.	Abscess formed during convalescence, and was opened, leaving a sinus.	A small sequestrum found corresponding to outer table of the bone; resection of 3 cm. of 7th and 10 cm. of 8th ribs. Rapid recovery.
13	Rep. by Albertine. Case of Widal. Ibid.	Female, 24	Swelling under right nipple.	Osteitis.	At beginning of convalescence.	Swelling persisted for four years, then formed an abscess, and persisted as a sinus for six years longer, when three sequestra were expelled and the wound rapidly closed.
14	Rep. by Albertine. Operators, Achard and Broca. Ibid.	Male, 27	Left border of sternum, rib not mentioned.	Osteitis.	Tumor appeared during course of typhoid fever; three months later it was incised, and pus evacuated.	Bacillus of Eberth found. Recovery in one month.
15	G. Sultan. Deutsche med. Wochenschr., Aug. 23, 1894, vol. xx. p. 675.	Female, 35	1st and 12th and clavicle, right side.	Osteomyelitis.	During convalescence two abscesses appeared, which were opened and formed sinuses.	Radical operation six years after typhoid. Two sequestra removed, and the diseased bone curetted. Prompt recovery. Bacillus of Eberth in clavicular lesion, the other not examined.

No. of case.	Operator and reference.	Sex and age.	Ribs affected.	Kind of diseases.	Time of appearance.	Treatment and remarks.
16	C. Achard and Broca. Gazette hebd. de Méd. et Chir., Paris, 1895, vol. xxxii. p 42.	Male, seaman, 26	Left 8th costal cartilage.	Chondritis.	During convalescence a circumscribed tumor over eighth costal cartilage formed.	Operation a few weeks later. The tumor consisted of a mass of granulation tissue; 2.5 cm. of left eighth costal cartilage were removed, including tumor. Recovery. Typhoid bacillus found.
17	Carl Caspersohn. Festschrift f. Friedrich von Esmarch, 1893, p. 453.	Female, 33	7th and 8th ribs, also tibia, olecranon, and other places.	Osteitis.	.....	Tibial tumor operated upon; other got better. Unguentum cinerum prescribed. Probably cured.
18	Otto Barbacci. Lo Sperimentale, Florence, 1891, vol. xiv. p. 365.	Male.	Right fifth rib near sternum.	Periostitis.	During convalescence, before fever had entirely subsided, a swelling appeared over fifth rib.	Abscess formed and was opened, and 3 or 4 cm. of the 5th rib excised. Result not stated. Typhoid bacillus found in pus.
19	Englisch. Wiener med. Presse, 1867. p. 1204.	Male, 33	7th and 8th ribs.	Periostitis.	About six weeks after convalescence from typhoid.	Abscess formed and broke; no operation.
20	Leon Duclos. Des Complications Osseuses Provoquées par le Bacille d'Eberth dans la fièvre typhoide, Paris, 1895, p. 22.	Male, 22	6th and 7th ribs.	Osteitis.	Immediately after convalescence.	Incision and curetting of wound. Recovery.
21	Leon Duclos. Ibid.	Male, physician,	Tumor developed under right nipple.	Osteitis.	During convalescence from typhoid.	Incision evacuated a quantity of pus. Recovery.
22	Buschke (case treated by Helferich). Fortschritte der medizin, Berlin, 1894, vol. xii. p. 575.	Female, 66	5th and 6th ribs, right side.	Periostitis.	During convalescence from typhoid.	Incision and curetting wound affected part of rib. Cure. Bacillus of Eberth found.
23	Paul Hoffman. Zur Casuistik der Knochenerkrankungen nach Typhus Abdominalis. Greifswald, 1888, p. 17.	Male, 61	5th and 6th ribs, at junction with sternum, right side.	.....	Two and a half months after recovery from typhoid.	Excision of ends of affected ribs. Recovery.

24	Paul Hoffman. Ibid.	Male.	Right 6th rib.	.....	Three months after attack of typhoid.	Excision of the end of 6th rib. Recovery.
25	C. Viannay. Arch. provinciales de chir., Paris, 1900, vol. ix. p. 323.	Male, seaman, 26	Left 8th rib.	Chondritis.	During convalescence from typhoid.	Excision of costal cartilage and end of rib. Recovery.
26	C. Viannay. Ibid.	Male, 36	Right 5th costal cartilage.	Chondritis.	Shortly after recovery from typhoid.	Excision of 2 cm. of cartilage. Recovery.
27	F. Finney. Trans. Col. State Med. Soc., 1899, p. 246.	Female, 35	Left 6th rib, half inch from sternum.	Necrosis.	Three weeks after recovery from typhoid.	Necrosed bone scraped out. Recovery.
28	F. Finney. Ibid.	Male, 36	Right 6th rib.	Necrosis.	About fourteen months after recovery from typhoid.	Necrosed bone scraped out. Recovery.
29	E. Finney. Ibid.	Male, 55	6th rib, sternal articulation.	Necrosis.	About three weeks after attack of typhoid.	Necrosed bone scraped out; operation only partially successful. Second operation, result not mentioned.
30	A. Ruais. Les manifestationes osseuses de la fièvre typhoide, Paris, 1899, p. 31.	Male, 34	Left 1st rib.	.....	Three weeks after attack of typhoid.	Excision of necrosed rib. Recovery.
31	Ernst Kuster. Med. chir. Centralblatt, Wien, 1882, vol. xvii. p. 473.	Male, 46	5th to 8th ribs, right side.	Perichondritis.	During convalescence from typhoid.	Excision of diseased cartilage and ends of ribs.
32	Jackson. Brit. Med. Journ., 1885, vol. i. p. 428.	Male, 42	Left 3d rib.	Periostitis.	About four weeks after attack of fever.	Abscess broke; some necrosis of rib; spontaneous recovery after seven months.
33	Parsons. Johns Hopkins Hospital Rep., 1895, vol. v. p. 417.	Male, 35	Left 7th costal cartilage.	.....	Pain during convalescence; a month later tumor appeared.	Tumor incised a month after its appearance; only blood evacuated, but sinus resulted. Four months later curetting, which was unsuccessful; four weeks later excision of cartilage. Cure after seven months. Bacillus of Eberth found.
34	Parsons. Ibid.	Female, 43	7th, 8th, and 9th ribs, right side.	.....	Pain appeared four months after recovery; fifteen months later a tumor developed.	Excision of sinus and cartilage about a month after tumor appeared; sinus resulted. Second operation of excision eleven weeks later; healed six months later. Bacillus of Eberth found.

No. of case.	Operator and reference.	Sex and age.	Ribs affected.	Kind of diseases.	Time of appearance.	Treatment and remarks.
35	Parsons. (Case of Osler.) Ibid.	Male.	Left 8th rib.	Periostitis. (?)	Pain appeared during convalescence; two months later swelling with but little soreness; this subsided, and five months afterward the swelling reappeared and subsided after six months, leaving a painless induration.	Guaiacol used locally during first swelling.
36	Valentini. Deutsche med. Woch, 1892, No. 22, p. 509.	.....	1st rib. (?)	Perichondritis.(?)	Pain over ribs occurred day after typhoid temp. became normal, and in eight days there was a fluctuating tumor.	About 10 c.c. of pus showing Eberth's bacilli were evacuated by incision through pectoralis major.
37	Paget. Surgery of the Chest, 1896, p. 157.	Male, 40	Left lower rib.	Periostitis and caries.	Some months after typhoid first symptoms appeared; pus formed and was evacuated, leaving a sinus.	Curettement of diseased cavity was unsuccessful; resection of costal cartilage was followed after a long time by complete cure.
38	Keen. Keen's Surg. Com. and Sequels of Typhoid Fever, p. 128.	Male, 42	5th, 6th, and 7th ribs, right side.	Osteomyelitis.	During convalescence.	Six operations before permanent cure was effected. Typhoid bacillus not found.
39	Keen. (Case of Rice.) Ibid., p. 133.	Male, 40	8th and 9th ribs, right side and sternum.	.....	Three months after attack of typhoid.	Phosphates internally; incision and drainage. Patient not cured.
40	Keen. Phila. Med. Journ., March 3, 1900, p. 508.	Male, 49	5th and 6th ribs on right side, and 6th and 7th on left side.	Osteomyelitis.	Pain developed during convalescence; two months later abscess appeared on both sides and broke, leaving sinuses.	Sinuses were open about ten months before radical operation was attempted, when typhoid bacilli were found in pure culture. After excision of diseased ribs and cartilage, wounds slowly healed, and nine months later were well.
41	Keen. Personal communication.	Male, 25	3d to 6th ribs, right side at junction with sternum.	Typhoid abscess from periostitis.	.....	Incision showed most of the diseased ribs dissected from soft tissue by the abscess. Cavity was scrubbed with gauze sponges, some infiltrated muscular tissue cut away, dusted with iodoform gauze. Patient discharged from hospital two weeks after operation, with wound almost healed.

42	Bernays. Personal communication.	Male, 19	6th or 7th rib.	Periostitis and necrosis.	Symptoms began eight weeks after typhoid fever, and four weeks later abscess broke.	Excision of necrosed rib 2½ inches long, wound packed with gauze and healed within three months. Complete recovery.
43	Tinker. Phila. Med. Journ., March 3, 1900, vol. p. 509.	Male, 31	Right 9th rib in mid. axillary line.	Necrosis.	Soon after convalescence.	Incision and curettement. Cure.
44	Schuster. Personal communication.	Male, priest, about 50	Left lower, probably 7th or 8th rib.	.....	A few weeks after convalescence.	Patient has been operated on a number of times by different operators, but sinus still persists.
45	W. L. Brown. Personal communication.	Male, 69	3d costal cartilage, right side.	Perichondritis.	Two weeks after convalescence.	A hard swelling which resolved.
46	W. L. Brown. Ibid.	Male, 35	Anterior end of 7th rib and its costal cartilage.	Osteomyelitis.	Six weeks after convalescence.	Abscess formed and was opened, and diseased bone curetted. Recovery.
47	J. F. McConnell. Personal communication.	Male, 41	Left 7th rib.	Periostitis.	During convalescence.	A hard swelling first formed and disappeared, then reappeared, formed abscess and was incised; soon healed.
48	J. S. Horsley.	Male, 42	Left 6th and 7th ribs.	Osteomyelitis.	A few weeks after convalescence.	Abscess formed, was opened, and later curetted, leaving sinus, which required two radical operations, resecting diseased ribs and cartilage. Complete cure.

Analysis of the Table. This table contains forty-eight cases. In twenty cases more than one rib was diseased. It is certain that there is a much larger number than this. Keen's *Surgical Complications and Sequels of Typhoid Fever,* published in 1898, has a list of forty diseased ribs following typhoid; this table, compiled four years later, contains seventy-eight. Calling attention to this subject, as Keen's book did, served to stimulate the accuracy of observation and frequency of reports of such cases, for it is not possible that such a sudden increase of reported cases within four years can be due to any other cause.

Sex. The sex is stated in forty-seven of the forty-eight cases. Forty are men and seven women. This is mostly owing to a much larger number of men having typhoid, but it would seem that the proportion in disease of the ribs is unduly great. In woman, the greater blood supply to the chest wall on account of the mammæ may explain this comparative immunity, as the resistance to infection would be thereby increased.

Age. A peculiarity above alluded to is that post-typhoid diseases of the costal cartilages and of the ribs, according to the table, uniformly occur in adults. Of forty-eight cases the age is mentioned in thirty-eight. The youngest is a boy of nineteen years (Case No. 42); the oldest sixty-nine years (Case No. 45). Under twenty there is one case; between twenty and thirty there are eight; between thirty and forty, twelve; between forty and fifty, ten; between fifty and sixty, three; between sixty and seventy, three.

Locality. In seven cases the ribs affected are not definitely mentioned. In the remaining forty-one they are as follows:

In the right side the first rib was affected once; the third, three times; the fourth, once; the fifth, nine times; the sixth, eleven times; the seventh, four times; the eighth and ninth, each three times; and the twelfth, once.

On the left side the first was affected once; the third, once; the fifth, once; the sixth, five times; the seventh, six times; the eighth, five times.

In cases in which the rib was mentioned, but not the side, the first rib was affected once; the fifth, twice; the sixth, three times; the seventh, five times; and the eighth, three times.

Two cases are reported in which ribs on both sides of the chest were diseased. Deducting these, there are left thirty-six cases in which the side is mentioned. Of these, twenty-one are reported as on the right, and fifteen on the left.

It would naturally be expected that, owing to the additional trauma of the heart's impulses, the left side would be the one most frequently diseased; such, however, is not the case. In sixteen cases either the anterior end of the rib or the costal cartilage is reported as being the seat of disease.

Kind of Disease. It is difficult to classify the kinds of disease, for one case may have several kinds, or one disease may be followed by another as a sequel. For instance, periostitis frequently results in osteomyelitis or osteitis. There are seven cases in the table in which the kind of disease is not reported. In the remaining number:

Osteomyelitis occurs	11	times.
Periostitis "	11	"
Necrosis "	8	"
Osteitis "	5	"
Caries "	2	"
Chondritis "	5	"
Perichondritis "	4	"

These terms are often used loosely and inaccurately, but making all allowance, it would seem that necrosis of the ribs does occur, despite Paget's assertion to the contrary. In case 13, three sequestra were expelled, then the wound rapidly closed. In case 15, two sequestra were removed and prompt recovery followed. In case 12, a small sequestrum was found.

Time of Appearance. In classifying cases under this head, where symptoms do not occur simultaneously, continuous pain in the region subsequently showing pathological changes is taken as the date of onset, unless swelling is first noted. Frequently the pain would subside, and it would be months or years before the lesion developed, but the disease must have merely remained quiescent during this period.

It was found necessary to put in the classification the term "during convalescence." Cases under this head probably occurred during the first six weeks, after the temperature from the typhoid attack had become normal; yet the writer does not feel justified in so classifying them.

In four cases the date of onset is either not mentioned or it is too indefinite to be classified.

During the attack of typhoid fever . . .	4 cases.
During first two weeks after fever	1 case.
From two weeks to six weeks after fever . . .	9 cases.
From six weeks to six months after fever . . .	2 "
From one year to three years after fever . . .	2 "
During convalescence	19 "

This illustrates the length of time in which the typhoid bacillus may be present and remain apparently inert.

Prognosis. In general it may be said that the prognosis as to permanent cure is not invariably good, though under intelligent and persistent treatment there is usually complete recovery.

Treatment and Results. The treatment mentioned in the table includes everything from masterly inactivity to most extensive resections, and seems to depend largely upon the case. Some cases are so mild that they resolve and disappear under practically no treatment, while others may tax the ability of the surgeon to the utmost and require repeated operations before a successful termination is achieved. In the obstinate cases nothing short of most radical procedures, going some distance into apparently healthy bone, will accomplish a satisfactory result. For

this reason a summary of different methods of treatment and their results would be misleading. For instance, two cases (No. 35 and No. 45) resolved, apparently requiring no local treatment; on the other hand, case 38 required six operations, the last three being most radical ones, before a cure was effected. Case 44, after a number of operations by different surgeons, still has a sinus.

Of some interest in the matter of treatment is case 3, where operation was refused, and a cure effected by injecting the sinus with methyl-violet solution every three or four days.

No definite rule can be laid down, but it would seem that if resolution fails to occur, incision and curettage should be practised. If this procedure appears unsuccessful after a few weeks, the diseased ribs and cartilages should be extensively resected.

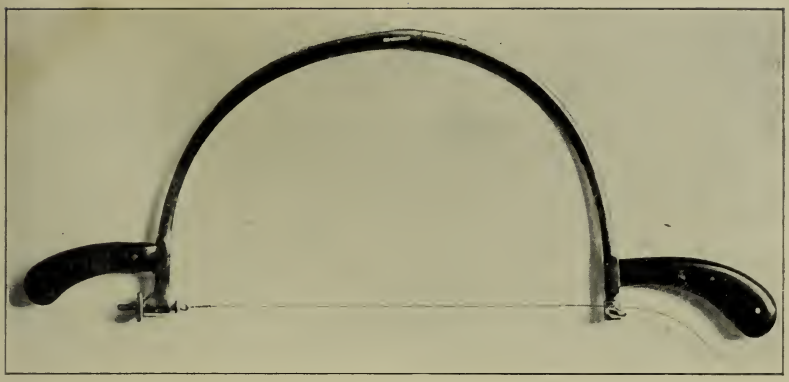
DEMONSTRATION OF A NEW HOLDER FOR GIGLI SAWS.

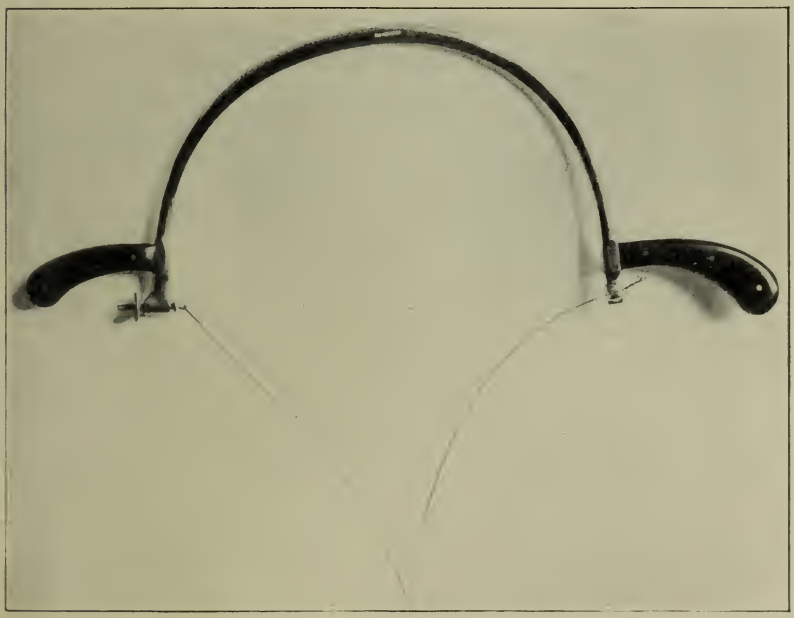
By J. Shelton Horsley, M.D.,
El Paso, Texas.

A notice of this holder appeared in *American Medicine*, December 21, 1901. The Gigli saw-holder shown consists of an arched frame of moderately rigid steel with a handle at each end. One end of the frame contains an opening and a stout set-screw; the other end has a square hole, through which works a traction hook with a tension nut. The Gigli saw is placed in position and held by a set-screw. The required amount of tension is accurately obtained with the tension nut. The saw-holder has two functions—first, when the Gigli saw is put on a stretch it can be used to cut either plane or curved surfaces, as in joint resections, etc.; second, by fixing one end of the saw with the set-screw, the other end may be passed under a bone and then caught on the traction hook. By alternately raising and lowering each handle of the holder the bone is divided.

There is one particular advantage in the use of this saw-holder. In performing osteoplastic operations on the skull as ordinarily used, the Gigli saw is liable to injure the dura, from the fact that there is marked convexity with its apex toward the brain. When used in the saw-holder, this difficulty can be very greatly diminished by so stretching the Gigli saw as to eliminate most of this convexity.

The advantages claimed for this saw-holder are: 1. The same instrument can be used to saw plane or curved surfaces, or as a chain saw. 2. It can be made to saw either





Gigli saw holder.

plane or curved surfaces by merely changing the direction of pressure. 3. When the instrument is used as a chain saw, any desired angle at which the saw works best can be obtained and kept by taking up or letting out the necessary amount of slack in the Gigli saw. This may be done with the set-screw..

DISCUSSION.

Dr. A. P. Morgan Vance, of Louisville.—I have seen several cases of post-typhoidal bone troubles. I have also seen spinal lesions following typhoid fever. I have had them occur at all intervals, from the primary disease, almost as late as he mentioned. I did not know before that the bacillus typhosus was the active agent. I thought it was simply ordinary pyogenic disease that was taken on by the depression following typhoid fever, and I was glad to hear Dr. Horsley's explanation of this.

I am delighted with the saw he has exhibited, believing that it meets the indications. The Gigli saw, as ordinarily used, has not been satisfactory, and I believe this bow saw will prove advantageous.

Dr. Joseph Price, of Philadelphia.—I have had some sad personal experience in my own family in connection with typhoid fever. But the experience I wish to refer to relates to my brother, whose life has been, from a surgical standpoint, a series of surgical calamities. He had been ill for months, he was under the care of a good clinician who early recognized the developing sequelæ necrosis of the rib. As my brother did not seem to get much better, it resulted in his asking me to remove a rib a short time ago. For five generations typhoid fever has occurred in my family. There is undoubtedly a family predisposition to certain infections, and this would seem particularly true in regard to typhoid fever in my family, because for five generations almost every member has had it. I have known as many as fourteen members ill from the disease at the same time; three of my brother's children, four of my own, my brother and his wife, etc. My brother died and he was unconscious for eight weeks and out of practice for about two years. I removed nine inches of his seventh rib at a late hour. Had the operation taken place a week earlier

he would have been relieved of much suffering and prolonged illness. The operation was easy; I removed the rib from end to end. I said some nine inches—it was more than that, because I severed with pliers both cartilages, and made a complete removal of his rib. A short time after the removal of the rib I happened to pick up a valuable paper in which two operations of that character were detailed, and the author dwelt at length upon the sequelæ of such operations, pneumothorax, and other conditions. Were I to do many of these operations I should prefer the ingenious electrical machine in the shape of drills and saws that have been recommended, for the reason that one can do the work so much more rapidly with them and with a degree of safety that you cannot apply with your hands. But the point I wish to make is this, that the sequelæ of typhoid fever, like the sequelæ of many other affections, are dealt with too late, for the reason that amyloid changes may occur in the liver, kidney, and other organs, and all operations on these cases are done at the eleventh hour. The operations are rarely done until someone is dead.

Dr. Hugh H. Young, of Baltimore.—I have been very much pleased with Dr. Horsley's paper. His summing up of the literature in regard to the length of time the typhoid bacillus may remain and cause infection is interesting, and I desire to mention two cases of my own, which also show the great length of time the infection may continue after typhoid fever.

The first case was that of a man who had chronic cystitis which had begun during an attack of typhoid fever. I saw him first seven and a half years afterward. A microscopic examination showed that the urine contained numerous small thin bacilli which cultures proved were the typhoid organism. I have seen him recently, and although he has been under treatment typhoid bacillus are still present, now nine years since the typhoid fever attack, and I do not believe it will be possible to get them out of his bladder. A cystoscopical examination showed numerous ulcers in the bladder.[1]

Another case was that of a man who, following an attack of typhoid fever, had symptoms of infection pointing to the left kidney. He came to me eight years after his attack of typhoid fever, and I obtained cultures from the urine, and found the

[1] Reported in full in the Transactions of the Johns Hopkins Hospital, vol. vii.

typhoid bacillus in pure culture. I operated on the greatly enlarged kidney, and obtained pure cultures from it. This was eight years after the attack of typhoid fever. I believe, as we study more and more the processes following typhoid fever, we are going to find frequent examples of infection from the typhoid bacillus continuing long after the fever attack.

Dr. Horsley (closing).—I originally became interested in this subject from the fact that in the case of typhoid-fever I had the ribs were affected on the left side, and in going over some literature on the subject, after noticing that the left side was involved in seven or eight case—practically all I saw reported—I thought there must be some reason for it. I formulated the theory that it was due to the fact that the left side being subjected to the impulses of the heart might probably account for the frequency of its involvement. On the contrary, after looking over the literature more thoroughly, I found that the majority of cases were on the right side instead of the left. My theory, therefore, tumbled.

Dr. Miles F. Porter, who was here yesterday, but had to leave last night, related a case to me that he had had. I wish he was here to report it. In his case two ribs were involved (I don't recall which side); the man was forty years of age.

As to the saw-holder, I wish to say that this is the original model which you have seen. It has been changed to some extent from the fact that, in the first place, it was unnecessarily large and inconvenient to carry. The arch is made lower, the handles are a little larger, and the set-screw is made stouter. This model is quite an awkward size to put in a bag. The thumb set-screw sometimes requires considerable force to manipulate.

I may say, in conclusion, that I did not intend to convey the impression that the saw-holder was used in resection of the ribs, for such is not the case. The two papers were together on the programme, merely for convenience and because both could be read in the time allotted to one.

STONE IN THE KIDNEY.

By Mack Rogers, M.D.,
Birmingham, Ala.

Nephritic or renal calculi, clinically speaking, differ from what is usually known as gravel only in the size of the concretion.

This paper will not go into the general history, etiology, pathology, etc., of renal calculi, but will be confined to the diagnosis and treatment of them, together with the report of two cases. To diagnose a kidney stone is not always an easy thing to do, yet sometimes we have comparatively little trouble in doing so. The clinical history, pain, tenderness, swelling, and the condition of the urine are the chief guides in arriving at a diagnosis. The patient's attention is usually first attracted by the condition of the urine or, possibly, by an attack of renal colic, followed by the passage of a gravel. They usually give the history of previous attacks of pain in the lumbar region, paroxysmal in type and of a boring, biting, or tearing character. This pain is usually excited or intensified by exercise, such as walking, running, jumping, or riding horseback or over rough roads, or it may be brought on by pressure, such as is made during an examination, or by the position of the body. Some patients get relief only by assuming certain postures. Tenderness is nearly always present, if we are only careful to elicit it. This may be done by causing the patient to assume the dorsal position; then, with the fingers in a triangle just below the back part of the last rib, if we lift the patient, as it were, on our finger-tips, directing them

upward and inward, we will elicit the tenderness. We can then compare one side with the other, and the two sides with the normal.

As to the swelling in the kidney region, this, of course, will depend entirely upon the amount of enlargement that would accompany a great stone or much detention of urine, with corresponding dilatation of the kidney. The urine I regard as the most reliable guide in these cases, especially when taken in connection with the clinical history. The urinalysis should always be both chemical and microscopic.

The segregator should always be used, in order that we may determine accurately which organ is involved, and to be sure of the condition of the other as well. It is important to remember that the condition of the urine varies; at one time for days together the urine is practically normal, at another it is slightly colored by blood, and at still another time the blood is so abundant that the whole fluid passed will actually coagulate. At these same or subsequent times examination will reveal abundant pus. And this pus, we should remember, is always a strong pointer, because it is due to a stone in the large majority of cases of pyuria. There is usually, also, a large quantity of mucus present in this urine, so that when the mucus and blood are abundant the tendency to coagulate is great.

The quantity of urine also varies in different cases and in the same case at different times. When the stone is loose and movable in the kidney it irritates and causes a copious flow of urine. On the contrary, when the stone is fixed it makes pressure, and hence the amount of urine is diminished. Therefore, when the microscope reveals much blood, pus, mucus, and sometimes small particles of the concretion we should feel almost positive that we have a stone, especially when taken with a strong clinical history.

A right kidney stone must be differentiated from an abscess of that organ, benign and malignant growths, together with perinephritic troubles from gallstones, appen-

dicitis, Pott's disease of the spine, and in the female ovarian and uterine troubles. A left kidney stone must be differentiated from pyloric, splenic, pancreatic, and intestinal diseases, together with Pott's disease, and in the female troubles of the generative organs. The treatment of the stone in the kidney is, of course, surgical. The various surgical methods cannot be even hinted at because of lack of time. We shall speak only of the oblique lumbar incision.

The first deliberate successful nephrolithotomy was performed by Mr. Henry Morris, of London, a little more than twenty years ago. Since then modern surgery has carefully located, explored, and taken possession of what had before been an unknown surgical domain. The necessity for an early diagnosis and surgical intervention in these cases is so imperative that we should not hesitate to make an exploratory incision when in doubt.

The technique of the operation for removing a kidney stone is as follows: The patient is placed on the sound side with a firm pillow under that gastro-iliac region. This gives prominence to the field of operation. An incision from five to six inches long, parallel to the lower border of the twelfth rib, is made, passing obliquely downward and forward, dividing the latissimus dorsi, part of the quadratus lumborum, and the three flat abdominal muscles, as well as the transversalis fascia. This brings us down on the fatty capsule covering the kidney, which may be observed to move with respiration. This adipose tissue is carefully divided over the back part first; then gradually freeing the balance of the organ until we reach the hilus, we now begin by blunt dissection to deliver the kidney into the field of operation. In doing this we have an opportunity to palpate the whole organ for stones, and if none are found while the organ is supported by the fingers of the left hand passed on either side of the vessels and ureter, we proceed to explore the organ along the median line of the convex cortical surface with an aspirator needle. If the needle strikes

a stone we leave it there to cut down by. Then, with a sharp knife, we are cautious to make the incision exactly in the median line down to the stone or pelvis. This opening in the parenchyma should be only large enough to admit the finger or remove a small stone; if it is a large one it should be broken by strong forceps and then removed. This kind of opening will admit of the exploration of the pelvis, calyces, and the detection of small stones in even the parenchyma of the kidney.

The bisection of the kidney from pole to pole, I am convinced, is unnecessary in the large majority of cases. The hemorrhage during the operation is controlled by compressing the vessels with the fingers that are supporting the kidneys. When we have removed the stone or stones from the kidney we should explore the ureter with either a metallic or flexible bougie to make sure it is patent. If we detect a stone in it or any abnormality it should be removed or corrected at once, otherwise we will be chagrined by having a permanent lumbar urinary fistula.

To permanently control the bleeding after the operation we must either suture or pack the wound. The sutures are safest and best; these should be of catgut and passed deeply, including all the substance of the kidney, the number depending on the size of the wound. If the wound is infected and drainage necessary, the gauze should be placed in position before the sutures are all tightened up, so that when they are tied they will effectually control all bleeding. I it is an infected case it is well to suture the margins of the kidney wound to the margins of the surface wound to prevent perinephritic infection. When the organ has been restored to its position, the fatty capsule and other structures should be brought together by buried catgut sutures, leaving an opening for drainage, unless we are confident of asepsis.

I will now briefly report two cases:

Mrs. M., aged sixty-five years, German, stout and of a robust build. She was bedridden and suffering from pro-

found sepsis when I first saw her. She gave the history of having suffered over twenty years from some mysterious trouble that no physician had ever been able to diagnose, although she had consulted many men of prominence even outside her own State, as she was a woman of considerable means and able to do so.

She complained to me of everything in general, but of her back in particular, and described the condition of her urine as something dreadful. The back trouble was of a dead, aching character, with occasional sharp pains running down from the right kidney to the labia and thigh. These sharp pains lasted for hours at a time, until, by shifting the position of her body, she obtained comparative ease, but was never entirely easy. This condition of affairs had existed, she said, for more than twenty years, and, having failed to obtain any relief, or even know what was the trouble, she had become a morphine habitué, and had, at her physician's suggestion, provided herself with a hypodermic syringe and bought the large size morphine tablets by the hundred. So she was regarded in her community, not as an invalid from disease, but rather a morphine fiend.

At my first visit she gave me as clear a history of a stone in the kidney as I could read from a book, and explained fully all about the morphine habit. The urinalysis by a pathologist revealed abundant pus, blood, and mucus, and he gave it as his opinion that there was a stone in the kidney. I announced my diagnosis to both the patient and her family, and suggested the only hope of relief, of course, explaining to them the gravity of such an operation in her condition. The family objected, but the patient was exceedingly anxious to have it done, since she was positive I was right in my diagnosis.

The oblique lumbar incision was made, and palpation revealed this large stone filling up the entire pelvis and sending offshoots up into the calyces. The incision was made in the median line of the cortex down to the stone. It was surrounded by pus and a quantity of sundry gravel,

which was removed. The organ was greatly enlarged, but the parenchyma was not extensively destroyed. The hemorrhage was alarming and had to be controlled by gauze packing; but this could not be done effectually until a strip of gauze was passed around the kidney to anchor it to the back. The walls of the abdomen were so very thick that I could not deliver the organ on the surface for the operation, and hence was at some disadvantage in controlling the blood. The wound in the kidney was not sutured but packed firmly with gauze, which served the double purpose of controlling the hemorrhage and affording drainage. She had a stormy time, surviving the shock, and died on the fourth day of sepsis.

The second case was a boy, aged fifteen years, well grown, but pale and anæmic. He had measles when ten years old, and ever since then his mother said he had complained of his back when he was required to use it much, yet not enough to cause them to give it any special attention, until finally, in the spring of 1900, he noticed he was passing an unusual quantity of urine, and that it loamed in the vessel. Meantime he was working as an elevator boy, but found he was compelled to remain at home, in bed, from one to three days each week until, finally, he had to abandon work altogether.

In July or August, 1900, he first discovered and called his mother's attention to blood in the urine, which increased steadily until the operation, in November, 1901. Meantime he discovered large quantities of yellow muddy deposits in the vessel when it was allowed to stand, and when the blood was so abundant the whole fluid passed would coagulate.

During this time he drank large quantities of water, as much as a gallon during the night, and passed as much urine at frequent intervals in the same time. One remarkable thing about him was that he did not lose either his flesh or strength, but seemed well nourished, although pale and cachectic.

The oblique lumbar incision was made, and when the pelvis was reached I could plainly make out this small peach-kernel shaped stone in it. When the organ was in the field I made a small opening in the median line of the cortex down to the stone, introduced my finger, and explored it; then, with a long polypus forceps removed it. The hemorrhage was easily controlled during the operation by compressing the vessels at the hilum with the fingers, and after the operation the hemorrhage was controlled by a few deep catgut sutures through the parenchyma and fibrous capsule. A strip of gauze was left in for drainage and the surface wound closed in the usual way. The boy made a rapid and complete recovery, and is now entirely well, working in a grocery store.

The first case I regard as the very worst kind, and the second case the very best kind to operate upon. If this paper only elicits a liberal discussion of the subject I shall feel amply rewarded for the time and pains bestowed upon it.

DISCUSSION.

Dr. J. G. Earnest, of Atlanta, Ga.—I shall not take up the time of the Association with a lengthy discussion of this paper, but I have recently operated on a case which had one very interesting feature, namely, the enormous amount of pus drained off and the exceedingly slight effect on the patient's health. The patient was a young man, aged thirty years, who claimed that he was perfectly healthy up to twelve or fifteen days before I first saw him, when he began to pass some pus with his urine. He called in a physician; he had pain in his left side, and at the time I made my first visit I found there was a distinct tumor reaching down on the left side to a point almost to the navel and extending back toward the left kidney. He was passing at that time not less than half a pint of pus a day, and he passed fully half a pint of pus every day after I saw him until I removed the kidney, about ten days later. I supposed, as a matter of course, he had a stone in his kidney. There were no microscopic manifestations in his urine, except pus. There were no bacilli. The patient

was operated on ten days after I first saw him. I found no no stone, but simply a shell of the kidney, containing, as several of my medical friends thought, between two and three pints of pus. There was nothing to do but to remove it. The ureter was found to be patulous. I removed the kidney, and the patient made a prompt recovery, although there was a discharge of a considerable amount of pus for probably ten days or two weeks afterward. I simply mention this case on account of the large quantity of pus that was passed and the absence of stone or anything else. I could not account for it other than that it was simply an inflammatory trouble set up, for which I am absolutely unable to account. The urine was saved every day, and after standing for twenty-four hours in glass bottles the quantity of pus was carefully estimated. After sending to the sanatorium my observation was confirmed by Dr. Stockard the two days he was in the house before operation.

Dr. Charles W. Oviatt, of Oshkosh, Wis.—I wish to add the history of a case similar to the first one reported by Dr. Rogers. A woman, aged forty-nine years, gave a history of stone in the kidney of fourteen years' standing. At the time I operated on her she had lost so much flesh and was so cachectic in appearance that I was prepared to find a malignant growth, but did not. She passed a considerable amount of pus, or gave a history of having done so.

I wish to add my testimony in favor of the Harris segregator. It was mentioned yesterday in a discussion, and condemned by one or two men. While I am not as expert in the use of the ureteral catheter as I might be, still I do not believe it is the right thing to catheterize the ureters in such cases as this, and I have been satisfied in using the segregator. In this particular case I was able to get pure pus from one kidney and pure urine from the other, so I had no hesitancy in going on with the operation. The stone removed weighed less than eight ounces. The patient made a good recovery.

Dr. Joseph Price, of Philadelphia.—Dr. Rogers' paper should receive considerable attention. The profession have demonstrated beautifully recently that they are about as slow in recognizing the conditions under discussion as we were in 1847 in crossing the Continent. I have had patients who carried their hand over the right or left kidney for thirty years. One woman carried her hand over her left kidney through

four gestations. I recently operated on a patient who spent $23,000 between the shores and trips to Carlsbad, to California, and other parts of the world. He had an abscess as large as a Derby hat, which was removed. I think there is but one solution of this question, and that is for general surgeons to become more familiar with renal lesions under discussion and not overlook them until a good general practitioner commands him to do surgery that should have been done early.

Historically, I am glad Dr. Rogers alluded to the first stone operation. I did my first stone operation in 1878, on the left kidney, removing a large stone. Again operation two years later, and I have been operating for stone in the kidney since then. If the record is correct I may claim priority. A patient at Lansdowne, Pennsylvania, upon whom I operated three weeks ago, carried a stone in her kidney for twenty-seven years. It is surprising the number of patients at the present day we are called upon to operate on for troubles antedating our graduation in medicine. Nothing seems more lamentable from a diagnostic point of view. It would seem, from the well-marked symptoms so beautifully recorded in the two valuable papers presented for discussion, that such errors and procrastination should not be committed by an intelligent and enlightened profession. It hardly seems possible that a patient should be permitted to carry a large stone in the kidney for a quarter of a century, with pus escaping through the ureters into the bladder and being voided with the urine. It seems to me, we ought to be sufficiently expert in diagnosis at present to recognize these troubles early and to relieve suffering, and not permit patients to become morphine fiends, as referred to in the papers.

Only recently I was called in consultation to see a patient who had been seen by five physicians. One thought her case was one of old surgical kidney. She had changed physicians repeatedly, and had been treated for a quarter of a century for Bright's disease and other affections. When I incised the kidney I had to step aside to get out of the way of pus, and removed a large stone.

A few days ago I operated upon a prominent lady's sister in Philadelphia, who had made four trips to California and several trips to Europe for a simple stone in the bladder. It would seem to be pure carelessness on the part of the profession, from a diagnostic standpoint, that these cases should

be allowed to suffer so long. We should look over and examine our cases more carefully. We should use the ingenious and perfect methods of diagnosis at our command, particularly the segregator of Harris. There is no reason why the general practitioner, worked hard as he is in small towns, should not be able to make an early diagnosis in many of these cases, and not permit patients to go on for years suffering, as they do, from these troubles.

Dr. Hermann J. Boldt, of New York City.—I wish to say a word or two regarding the technique of the incision in these cases. Dr. Rogers mentioned the fact that the incision in the kidney should be small; that the stone should be crushed if one could not extract it through a small incision. It is my opinion that it would be wiser to make a larger incision rather than try to crush a stone in the kidney, thereby producing more trouble, more contusion of the kidney substance by the continuous use of the forceps, or in extracting fragments of the stone, or to extract the stone through a small incision as a whole. When the essayist spoke of fastening the kidney to the lumbar incision in cases where it was intended to drain, he probably meant the kidney capsule rather than the parenchyma of the kidney, because the latter tears so easily that it would be more desirable to pass the sutures through the capsule without bothering with the parenchyma.

Dr. Charles P. Noble, of Philadelphia.—I have had several experiences with stone in the kidney which have taught me several lessons. In the first place, I think it is very essential to study the condition of the other kidney before operating for the removal of stone, because the question of nephrectomy comes up in the advanced stone cases. If we do not have definite knowledge of the condition of the other kidney we are hardly in a position to deal with the one that is affected by stone. That is a very important point. I have operated twice for stone when no stone was found, although in each case the patient was known to have passed a dozen small stones. In one case the patient, during six or eight attacks, passed a number of stones, yet at the time of the operation there was no stone found.

The X-ray is of great value in demonstrating that a stone is still present. I am sure if we do not use the X-ray shortly before operation we will do an unnecessary operation in some cases. I have had that experience myself twice, and, while it

did not do the patients any harm, at the same time it was an unnecessary operation in each instance.

Dr. R. E. Fort, of Nashville.—I have the case of a young man which I think is sufficiently interesting to be added to this group of cases. The patient had been in the hands of suburban doctors at first; he finally came into the city, and was seen by some colleagues of mine. He had a large mass reaching down into the pelvis and over to the right of the umbilicus. According to the history, he had this condition five months before I saw him. There was no pus in the urine, yet he presented a typical septic condition. We advised operation, but he declined it. At the end of three weeks he returned and consented to an operation, and we operated, not knowing the nature of the condition we were operating for. I found a large nephritic abscess, and removed a stone. Evidently in the earlier stages of the disease there was pus, but after mechanical pressure had taken place it had closed the ureter and there was no pus present. The abscess was drained, and the pressure relieved. I do not remember exactly, but I should say in a week the boy returned and had pyuria. He recovered. As I have said, the ureter in this case was closed by mechanical pressure, and there was no evidence of pus in the urine. After the operation the ureter became patulous, verifying our diagnosis of the existence of a stone. The man made a prolonged but good recovery.

Dr. E. Denegre Martin, of New Orleans.—I should like to report a case which illustrates the point that we cannot always depend upon urinary analysis. About six months ago I was called to see a patient who was supposed to have had typhoid fever and had been ill for eight weeks. From the diagnosis, which was made by a competent practitioner, I believe that we had to deal with an abscess resulting from perforation of the bowel. This abscess filled the space of the left side, pointing forward anteriorily, with some slight tenderness in the lumbar region. I made an incision at the most dependent portion, removed about a pint of pus, and, to my surprise, half a dozen stones. On examination I soon realized that I was dealing with a case of stone in the kidney. The kidney was almost entirely destroyed. The patient's condition was such as not to warrant us in removing the kidney. We simply curetted the parts and packed. Up to that time the urine revealed no pus, and I believe I was perfectly justified in

diagnosing this case as an abscess resulting from perforation of the bowel. After the operation, however, there was quite a little pus secreted, showing that the ureter had been closed, by one of the stones, probably. The boy did very well after operation, but the sinus did not close. Another point, and one I regard of importance, is the use of the X-ray in these cases. I used the X-ray, and was able to locate the stone. It was a dumb-bell-shaped stone, which we could readily see with the fluoroscope. I operated the next day, removed the stone, and the boy is doing well. There are two points I would call attention to: first, blocking of the ureter, preventing the escape of pus, because I have no doubt there was pus originally; and, second, the diagnostic value of the X-ray in these cases. Where the stone is sufficiently large you can locate it or them, as the case may be, with the X-ray.

Dr. Rogers (closing).—I am glad to be informed of the early work on stone in the kidney by Dr. Price, and that he operated as early as 1878 for a stone in the kidney, a considerable time before Morris did his work. I am glad to know that Dr. Price did pioneer work in this direction.

With reference to the diagnosis, it is not always easy to make it in the early history of these cases, and the practitioner ought not to be censured too severely for not being able to clear up these cases at first. We must admit that the men who see these cases in the later stages have decidedly the advantage over those who see them early, and hence too much censure should not fall upon those who see the cases first. That was the case with the old man upon whom I operated.

With reference to the use of the segregator in these cases, if the ureters are occluded the segregator ought to clear up the question—that is to say, when you use the segregator and find no urine coming down from the ureter, it should settle the question as to the necessity of going in and clearing up the trouble.

ENDOMETRITIS.

By H. J. Boldt, M.D.,
New York City.

It is principally to Ruge, of Berlin, that we owe our more exact knowledge of uterine pathology. Ruge has made three main divisions of endometritis, namely, glandular, interstitial, and a mixed variety. These form the basis of all variations or special forms of endometritis.

In hyperplastic glandular endometritis the glands are increased in number to such an extent that the picture under the microscope is that which is usually designated as adenoma of the endometrium. The original glands may be and frequently are changed in their contour, becoming zigzag and extending into the muscular structure. The superficial epithelium as well as the lining epithelium remains unchanged, which is the chief feature distinguishing it from a malignant degeneration.

In hypertrophic glandular endometritis the contour of the glands is also changed, even more so than in the previous form; their calibre is distended in places, sometimes sacculated; these sacculations are occasionally filled with secretion. The distinguishing feature from hyperplastic endometritis is further based on the non-increase in the number of glands. Care must be taken that in sections made in a slanting direction the double or treble rows of epithelium sometimes seen under the microscope are not mistaken for a proliferation of epithelium, as found in malignant degeneration; this mistake can be avoided by studying numerous fields. The two forms of glandular endometritis may be associated in the same patient.

I have, in a number of instances, found the uterine cavity filled with polypoid nodules, in which the quantity removed aggregated from 15 to 20 c.c.; on microscopic examination the picture presented showed adenoma. Such conditions have been classed by some writers as a separate form: polypoid or fungous endometritis. While, clinically, such designation may be correct, I see no reason for classing such change under another name than adenoma of the endometrium from the point of view of pathology.

Acute interstitial endometritis is recognized by the diffuse invasion of small round cells into the stroma. Frequently pus corpuscles are also seen, and the vessels are found to be pressed apart and compressed by the invasion of the inflammatory corpuscles. Sometimes the round-cell infiltration is found more in the deeper stratum of the mucosa in patches, rather than in diffuse form. Later, when the disease passes into the chronic state, the glands become more or less obliterated, with atrophy of the endometrium. In another form of chronic interstitial endometritis, the stroma cells are enlarged and contain a centrally located nucleus, and resemble sarcoma cells to some extent.

The mixed forms of endometritis show that changes are present in both the glands and the interstitial connective tissue.

Endometritis is the most common gynecological disease coming under the observation of physicians. Most frequently endometrial inflammations are met with which are not due to the invasion of specific micro-organisms into the cavity of the uterus. They may, for the sake of brevity, be classed under one general heading, chronic endometritis. The statement that non-specific endometritis is not caused by pathogenic organisms may find opposition, but in a large number of specimens obtained from patients having the ailment, I have been unable to find micro-organisms, when necessary care was observed to avoid extraneous infection. I regard the examination of specimens taken from uteri which were obtained by hysterectomy as conclusive on this

point. There were twenty such specimens examined. The uteri had been removed either for cancer or for myomata.

The usual forms of endometritis caused by invasion of micro-organisms into the uterine cavity are (*a*) gonorrhœal, (*b*) septic, (*c*) tuberculous, and (*d*) diphtheritic. Syphilitic endometritis is added by most authors, but it has always seemed doubtful to me whether this as a special form was not questionable, because nothing in the changes of such uteri has been found which may be ascribed as characteristic of syphilis.

We know that while numerous germs are present in the vaginal secretions, likewise in the secretions in the lower part of the cervical canal, the uterus above the internal os and the Fallopian tubes do not, under normal conditions, contain micro-organisms. In fact, the vaginal secretions, and still more so those of the cervix, are more or less detrimental to their growth.

It is obvious that these conditions are changed in a puerperal uterus; hence the great care necessary to prevent infection in puerperal patients.

For the occurrence of a septic endometritis a lesion, or rather an abrasion, on some part of the endometrium is necessary upon which the organisms producing the illness —namely, streptococci and staphylococci—become implanted. In the puerperal state such lesion is always extensive. Outside of infections implanted upon lesions caused by physiological processes, septic endometritis may be and frequently is similarly caused by cervical dilatations, curetting, introduction of sounds into the uterus, in fact any traumatism which causes an abrasion of the part.

The saprophytic form of endometritis is produced by ptomains which cause their detrimental effects by being generated by dead or decaying animal products. Examples of this may be seen when membranes or placental tissue are retained in utero; likewise when disintegrating myomata or cancer in the process of breaking down are present in the uterus. Very little is known about the nature of

such saprophytes; they are supposed to belong to the obligat-anaerobic micro-organisms.

Gonorrhœal endometritis is the most frequently met with of all specific forms. A latent gonorrhœa is especially apt to be rekindled during the puerperal state.

While there are a few cases of diphtheritic endometritis on record, the disease is extremely rare; that which is usually called by this name is septic endometritis found during the puerperium and showing macroscopically a grayish-white coating resembling diphtheritic membrane. This is gangrenous tissue containing streptococci.

Of the forms of tuberculous endometritis, the ulcerative variety is usually met with. The acute miliary and the interstitial variety being seen very seldom. In fact, primary tuberculous endometritis is a rare disease.

While the etiology of all specific forms of endometritis is well understood, those not depending upon micro-organisms and ptomains in many instances have uncertain causative factors.

It is maintained by a number of authors that retroflexions of the uterus are not productive of endometritis, nor, in fact, of any symptoms. That assertion is erroneous. If a patient with marked retroflexion is observed for a long time, it can usually be demonstrated that she has an endometritis. I maintain that it is caused by a disturbance in the uterine circulation. Therefore, continuous disturbance in the circulation of the uterus, from whatever cause, must necessarily be regarded as an important factor in the causation of chronic endometritis. Hence, displacements of the uterus, or inflammatory conditions of the pelvic peritoneum, or pelvic cellular tissue, and all neoplasms of the uterus may be looked upon as etiological factors of endometritis.

Pathological changes in the tubes and ovaries likewise cause the inflammation under consideration. Brennecke, in the *Archiv f. Gynaekologie*, vol. xx., 1882, called attention to functional disturbances in the ovaries as productive of endometritis. His statements have been corroborated by

other observers. Another frequent cause of endometritis may be found in the continuous practice of interrupted coitus, so prevalent among those not desiring offspring. Further, infectious diseases and diseases of the circulatory system furnish additional contingent factors. Abortions with retention of particles of placental tissue likewise predispose to the development of endometritis.

Frequently recurring pregnancies at short intervals, especially if such women arise from the lying-in bed to attend to their household duties before the uterus and pelvic structures have undergone proper involution, give a fruitful source for the occurrence of endometritis.

Extensive cervical lacerations also have an important bearing upon the ailment under consideration. As a consequence of such tears ectropium of the cervical lips may result, the inflammatory changes in the vaginal portion extending to the endometrium. It is in such instances that trachelorrhaphy becomes a curative operation, and it is for the reason given above that I so urgently commend intermediate trachelorrhaphy, an article on which was published by me in the *Transactions of the American Gynecological Society*, 1889.

The changes which take place in the uterus and its mucosa vary according to the form of endometrial inflammation and the time of its existence. In all cases there is an increase in the structure affected. The uterus in the beginning is more or less enlarged and its consistency is relaxed, so that at times it feels as soft as a uterus in the first stages of pregnancy. Later the consistence changes, assuming in some instances a cartilaginous hardness; this condition is usually designated as chronic endometritis by the clinician.

The clinical diagnosis of endometritis is to be based more on the history which may be elicited from a patient than on the objective symptoms which may be present. Chief among the subjective symptoms irregularities of menstruation should be mentioned. Women who formerly had

been regular, with, for the respective patient, a normal loss of blood, bleed more profusely at the menstrual period; the period, which perhaps had formerly been of three or four days' duration, continues five, six, or more days with greater loss of blood. The intermenstrual period becomes shortened, sometimes only two weeks or less elapsing. Aside from this, various reflex symptoms manifest themselves, as disturbances in the digestive tract, indigestion, cardiac palpitation, headache; all these may probably be ascribed to the concomitant anæmia which results from the irregular loss of blood. When there is an increase in the size of the organ, with a corresponding hyperplasia of the muscularis, as is the rule in those patients in whom the chronic metro-endometritis is the outcome of a micrococcic infection, the patients frequently complain of a dragging sensation in the lower abdomen, backache, bladder, and rectal symptoms. The erosions which frequently are present on a voluminous vaginal portion as the result of the irritating cervico-uterine secretions, may also give rise to some bleeding on slight traumatism, the cylindrical epithelium being at times very delicate. I have known the bleeding continue for an hour or more as the result of a bimanual examination in my clinic.

It is not uncommon, even if such patients do conceive, to have them abort, usually before the fourth month, because the diseased endometrium does not permit of the development of a healthy decidua and a consequent viable embedding of the ovum.

Inspection of the vaginal portion of the cervix frequently reveals it to be of a reddish-purplish hue; often numerous Nabothian follicles are seen upon it. Its size is usually increased, frequently to double, but rarely to treble the normal size, and, as previously stated, the erosion upon it may bleed quite profusely when touched. The endometrium, when touched with a sound, bleeds more or less, sometimes considerably, and in some instances only sufficient to tinge the sound. Bimanual examination may show

an increased size of the uterus, sometimes slight irregularity in the contour, and increased firmness in consistence of the muscular structure, if the inflammatory process is one which leads to induration; or its consistence may be greatly relaxed, so soft that one may at times be in doubt as to the existence of an early pregnancy, as in instances of hyperplastic metro-endometritis.

Treatment. The local treatment giving the promptest relief from bleeding in instances of chronic endometritis is undoubtedly to be found in the judicious use of the curette. I would caution, however, that although the operation is comparatively simple, it should not be resorted to indiscriminately, as is especially being done by many general practitioners; neither should it be done by one not trained in the technique of gynecological surgery, because we frequently see serious results following its improper employment. Further, before the operation, it is imperative that a careful bimanual examination be made to determine whether or not a tubal swelling is present. I have known a tubal gestation sac and pyosalpinx to be ruptured as the result of the traumatism produced by the operation. In a few instances I have desisted from curetting and opened the abdomen subsequently, through the disclosures revealed by bimanual examination. If resorted to, however, the same precautions as to cleanliness should be employed as in a major operation. A dull curette, as was formerly used and as is still employed by some, is a useless instrument to denude the interior of its hypertrophied endometrium. The curette should be stiff, but the hand guiding it over all parts of the endometrium should be gently used. One must be competent to judge of the consistence of the muscular structure and not go beyond the mucous membrane. In my experience about 60 per cent. of the women are relieved from atypical bleeding for a variable period of time by curetting. After curetting it has been my custom to make an application of pure carbolic acid to the interior of the uterus. In patients who have not obtained the desired

relief by curetting, subsequent local treatment becomes necessary. This varies with the obstinacy of the condition. Usually applications of iodine or carbolic acid twice per week will suffice, but in some instances bleeding at the menstrual period is so profuse that I have found it necessary to resort to more heroic measures.

I consider the most heroic, among local measures, the application of chloride of zinc. I use solutions varying in strength from 20 to 50 per cent. The technique employed is to take a Braun's intra-uterine syringe, with a specially thin tip and having but one opening at the extreme end. Aspirate about ten minims of the medicament into the barrel of the syringe, wipe off the tip, then anoint it with ordinary vaseline; wrap the tip with absorbent cotton; introduce the cotton-wrapped syringe into the uterine cavity and eject the solution. With a dressing forceps hold the cotton at the proximal end of the tip and withdraw the syringe, thus leaving the medicated cotton in the uterine cavity. The vagina should be first packed in its upper part with bicarbonate of soda before a retaining tampon is inserted. The soda to some extent prevents the irritating action of the zinc chloride should any exude from the uterine cavity. After two or three days all packing is removed. The treatment should be renewed if the subsequent menstrual period indicates its repetition.

In instances of long-standing hemorrhagic endometritis, when the thickened endometrium is not sufficient to account for the menorrhagia and metrorrhagia, I have several times packed the cavity of the uterus with gauze moistened with chloride of zinc solution, with the express purpose of obtaining a deeper destructive action by the zinc chloride; and while this has usually given satisfaction in regard to the bleeding, there are serious objections to it, inasmuch that there is danger of causing cervical stenosis by the action of the zinc chloride, necessitating an almost continuous treatment at intervals of four to eight weeks to keep the cervical canal patent. Further, there is danger

of causing the occurrence of a parametritic or perimetritic exudate, which may take a long time to become absorbed. Vaporization has been used, with good results; however, the few times that it has been employed by me it did not impress me as better than the chloride of zinc treatment, which is one of the most satisfactory therapeutic measures which I have had occasion to employ. Existing displacements of the uterus which may be the cause of the endometritis should of course be remedied at the same time, if possible.

The general condition of a patient in all instances requires careful supervision. Good food, proper exercise, baths, douches of medicated or plain warm water, as the case may be, are all important adjuvants.

Occasionally a patient may come under our care in whom nothing will be of benefit; the bleeding is made milder only temporarily, the large indurated uterus produces numerous symptoms which make life miserable; in such instances it may be necessary to resort to hysterectomy. The same may be said of tuberculous endometritis, if the tubercular process cannot be cured by local treatment.

Patients having had a severe attack of septic metro-endometritis frequently suffer from the results thereof for the rest of their lives or until after the menopause has been passed. I have not found any method of treatment satisfactory with women who had such large indurated uteri, conditions as have been termed "fibrosis of the uterus" by some clinicians. If at all amenable to treatment the best results may be obtained by massage according to the method of the late Thure Brandt. The treatment is long, tedious, and requires much patience on the part of both the patient and physician. If one can get such patients under treatment soon after the acuteness of the disease has passed off, I have seen good effects from the use of electricity, both the galvanic and the faradic current, one electrode used intra-uterine and the large clay electrode placed on the abdomen. The current should be used every second or

third day for about ten minutes; but it is my opinion that unless the uterus is reduced to normal size and consistence in from four to eight weeks, it is useless to continue its employment.

The senile endometritis which is sometimes met with in women long past the menopause at times presents symptoms resembling cancer of the corporal endometrium, namely, slight irregular bleeding and at times a very putrescent discharge from the uterine cavity. A careful microscopic examination of the scrapings by a competent pathologist will decide the question. A similar procedure is frequently necessary to differentiate between other forms of endometritis and cancer, malignant disease being the condition from which a differential diagnosis is often requisite to properly treat such patients.

Neither tuberculous nor syphilitic endometritis show distinctive subjective or objective symptoms from other forms of endometrial inflammation. The diagnosis of tuberculous endometritis resting upon the microscopic findings, that of the syphilitic form upon the history and perhaps other existing symptoms of syphilis. The diagnosis of diphtheritic endometritis is based upon the finding of Loeffler's diphtheria bacillus.

Endocervicitis is of common occurrence and is usually found as a chronic catarrhal inflammation. It is obvious that inflammation of the cervical mucosa should be more frequent than that of the corporal endometrium, because of its nearer proximity to all deleterious influences which may act upon it from secretions present in the vagina. The secretion first becomes increased in quantity and varies in character according to the intensity of the endocervicitis. In the most obstinate cases it is mucopurulent. The mucosa becomes somewhat hyperæmic and swollen. The glands become somewhat changed in their contour and slightly increased in number. The excretory openings may become obliterated and small retention cysts form as a result. Associated with endocervicitis are the so-called ero-

sions found about the external cervical opening. Sometimes these seeming erosions are in small patches the size of a pinhead, but more frequently they are larger, varying in size and sometimes covering the whole under surface of the vaginal portion. The normal squamous epithelium covering the vaginal portion is changed into cylindrical epithelium. It is possible that the cylindrical epithelium in the cervical canal may be transformed into squamous epithelium. It should be borne in mind, however, that even without inflammatory changes the squamous epithelium may extend beyond the usual limits and into the cervical canal.

It has been demonstrated by Ruge and Veit that the peculiarity of the transformed squamous epithelium into cylindrical epithelium consists in a tendency of the transformed epithelium to extend into the tissue of the vaginal portion.

An endometritis caused by gonorrhœal infection shows that the superficial cylindrical epithelium is destroyed to a greater or less extent, and occasionally the cylindrical epithelium is changed into squamous epithelium. The mucous membrane becomes hypertrophied, sometimes to a considerable extent. The interglandular connective tissue becomes infiltrated with round cells and pus corpuscles. Frequently gonococci may be found in the scrapings obtained by curetting. The uterus itself is enlarged; its walls are thickened and usually firmer in consistence. That the metritis is caused by the invasion of the muscular structure by gonococci, as believed by Wertheim, has been proved by Max Madlener (*Centralbl. f. Gynaekologie*, vol. xix. p. 1316), who found gonococci in the muscularis in a patient with recent infection from whom the uterus had been extirpated.

The symptoms of gonorrhœal endometritis depend upon the virulence of the gonococci which caused the infection. The gonococci of a latent gonorrhœa do not, so far as my experience goes, ever give rise to acute symptoms. It usually requires a long time, perhaps several months, before

symptoms begin to manifest themselves of sufficient intensity for the physician to seek medical aid. The specialist is, in fact, seldom consulted until the disease has affected the Fallopian tubes. In such patients it is not always easy to make a correct diagnosis as to the cause of the existing leucorrhœa. The uterus, on examination, reveals the changes in size and consistence which one is likely to find in patients having endometritis, provided that the micro-organisms have invaded the interior. On using a speculum we are apt to find more or less erosion about the external cervical opening; the plug of glairy mucus which in a healthy condition is generally found protruding from the cervical canal, is found to be changed into mucopurulent secretion, which sometimes is quite profuse. The positive diagnosis, however, can only be made when it is possible to find gonococci upon microscopic examination of the secretion. The absence of them on a single examination would not, however, invalidate a gonorrhœal condition; only repeated negative findings would do this. In instances in which the secretion is scanty, I am an advocate of the use of Schultze's trial tampon. It is readily applied and certainly gives a result, so far as obtaining secretions from the cervical canal and uterine endometrium is concerned. It is made by taking a small tampon of absorbent cotton, saturating it with 25 per cent. of tannin in glycerin, applying it to the vaginal portion so as to cover the cervical opening, and placing over it a retaining tampon of non-absorbent cotton. After from twenty-four to thirty-six hours the tampon is removed and the secretion on the trial tampon examined microscopically.

Patients suffering with an acute gonorrhœal infection present no diagnostic difficulties, especially if one resorts to the aid of a microscope, because in acute cases gonococci are plentiful.

The treatment of acute gonorrhœal endometritis should be, as in all other acute endometrial inflammations, absolute rest in bed. The application of an ice bag to the hypo-

gastric region, vaginal douches with a mild antiseptic solution, 1:10,000 bichloride of mercury, or a 5 per cent. boric acid solution. A bland diet is indispensable.

After the endometritis has become chronic it should be treated with intra-uterine applications of one of the usual remedies. I prefer a 10 per cent. solution of carbolic acid. Frequent intra-uterine irrigations with large quantities of a mild antiseptic solution also give a good result. If the secretions from the endometrium be very profuse, curetting with subsequent local treatment is generally beneficial. The diet which in the acute stage should have been bland, should now be generous, plenty of nutritious food, but not highly seasoned, should be partaken of.

The endometrial changes caused by infectious diseases are mainly of a congestive nature, therefore the condition has usually been designated "hemorrhagic endometritis."

Septic Endometritis. Among the forms of acute endometritis, the septic variety is most frequently met with. It is either found after full-term delivery, abortion, or surgical interventions on the uterus.

The pathological changes which take place in a uterus the seat of septic and saprophytic endometritis may be considered together. The ailments may likewise be considered under one designation, namely, "puerperal endometritis." Puerperal endometritis differs primarily from the other forms in that the mucous membrane in the uterus is not intact. A denuded rough area is present upon which the disease producing elements first exert their deleterious influence. The anatomical changes found in the uterus and endometrium vary according to the intensity of the infection. In intense instances of sapræmic infection the interior presents a putrid appearance; the same may be the case in septic infections, in which the surface frequently presents a mottled appearance. It may also at times present the appearance of being covered with a diphtheritic membrane. This is not likely to be anything more than gangrenous tissue in a drying-out process, caused by and

containing micro-organisms, and preparing to be cast off.

The bacteriological difference between the two forms of endometritis considered under this head consists in this: that septic endometritis is caused by infection with micro-organisms, such as streptococci and staphylococci principally. Sapræmia is due to the absorption of ptomains originating from decaying animal matter within the uterus, as placenta, membranes, and blood. The lochia being made up of such constituents, their retention produces a similar effect. One should bear in mind that sepsis and sapræmia may be associated in the same patient.

If the infection is not too intense, the invasion of micro-organisms is walled off by a zone of round-cell infiltration, which is termed the reaction zone. In intense infections, however, the entire muscular wall of the uterus may be traversed by micro-organisms, and a conglomeration of the round-cell infiltration breaking down, may lead to the formation of an intramural abscess.

The uterus in all patients with acute puerperal endometritis is enlarged and greatly softened in consistence, metritis and endometritis being invariably associated in these infections.

An intense puerperal metro-endometritis always results in chronic metro-endometritis if the patient does not succumb to the primary disease.

While from the point of view of a pathologist there is no difference between septic metro-endometritis of puerperal origin and that of traumatic origin, except the partially denuded interior of the uterus in puerperal cases, I have never seen such intensity of the ailment in non-puerperal patients; therefore the prognosis is, so far as my observation goes, better in those patients in whom the infection is caused by some surgical intervention.

The symptoms vary with the intensity of the infection. More or less elevation of temperature is usually present; absence of fever is, in fact, an exception. Pain is not likely

to be a marked symptom except upon pressure on the uterus, unless the peritoneum is involved. Usually one or more chills are present, but I have not always seen this symptom, even in some very intense septic infections. The pulse varies with the intensity of the infection; in mild cases it is not likely to be much accelerated, if at all. The excretions from the uterus may be profuse, but, unless the infection be of a saprophytic nature, no odor is inherent to the discharge. It is astonishing to see that so many general practitioners consider the absence of odor of the excretions as favorable, whereas the most serious septic patients have but comparatively little odor.

Patients who have a mild septic infection generally begin to convalesce in a few days after the first symptoms of infection have manifested themselves, the micro-organisms having been prevented from traversing deeply into the uterus, usually not beyond the endometrium, by the barrier of cell infiltration, the so-called reaction or granulation zone. They are then thrown off with the secretions, and the patient makes a good recovery without leaving any traces of the infection. It is different, however, with the more intense infections in which the micro-organisms traverse into the muscular structure of the uterus, along the course of the lymphatics, and into the circulation. In such patients the temperature remains high, with intermissions, the pulse rate remains increased, and lasting pathological lesions remain in the uterus. The illness is a long one, if such patient escapes with her life.

The treatment in such cases should be general. Absolute rest in bed and the application of an ice coil or a large ice bag applied on the lower abdomen should be resorted to. If the infection is of a sapræmic nature, and if retained placenta or membranes are in the uterus, they should be removed manually, if at all possible; then an intra-uterine irrigation of a mild antiseptic solution at low pressure should be made. One must be governed by general conditions so far as local treatment is concerned. Intra-uterine douches

at intervals may be made to advantage in some instances. This holds good especially for those patients who have profuse uterine secretion accompanied by a temperature from 101° to 103° F. If it is found that an irrigation in such patients has reduced the temperature, and if she herself feels better after the douche, light massage of the uterus (apparently severe infections excepted) has seemed to me to act beneficially by causing uterine contraction, thus making the consistence of the uterus firmer.

Soluble silver introduced into the uterus and applied externally in the shape of an ointment (Créde's ointment) is said to be satisfactory. Créde has reported excellent results from its use. I have not been able to corroborate this in my practice.

While curetting is strongly advocated and extensively made use of in such patients, I condemn this intervention very decidedly, having seen the condition of patients only made worse by it. It has, I believe, caused deaths, directly and indirectly. Fresh avenues of infection are made with the instrument. It is impossible, even with vigorous scraping, to remove all the streptococci and staphylococci, and on the fresh wounds made with a curette the remaining micro-organisms multiply with great rapidity, aside from the danger of easily perforating a puerperal uterus. Hysterectomy is advocated by Prochownick, of Hamburg, in instances in which patients have bacteriæmia, and if it seems probable that the source of infection is limited to the uterus. He has had some good results from this procedure. I, too, have done a number of operations under such circumstances, but, in my opinion, it is as yet of doubtful utility, especially so after having made careful observations from a purely scientific standpoint on a large number of patients, aided to a great extent by my house staff in the Post-Graduate Hospital and by Prof. H. T. Brooks, to whom I here express my high appreciation for their services. I had two patients recently with a pure streptococcus infection, without the possibility of extraneous contamination

of the blood, which was taken from the median cephalic vein at the time of making an intravenous infusion. Both recovered. A similar experience was had with a staphylococcus infection. No surgical intervention except the intravenous infusion was resorted to. I am still in doubt as to the proper or, rather, the best, treatment for patients ill with bacteriæmia. So much, however, is certain in my opinion: that the less meddling locally done the better are the chances for such patients to recover.

DISCUSSION.

Dr. A. Palmer Dudley, of New York City.—I was not present during the reading of a portion of Dr. Boldt's paper. If he says that he is doubtful as to the utility of surgical intervention in cases of sapræmia, we may place it upon record as a careful observation, and we can accept the conclusion arrived at by him from a large experience in cautioning us against doing a hysterectomy and subjecting a woman already in a dying condition to a most trying capital operation, and the removal of the local focus when a general condition exists.

Another point he emphasized was the application of cold in these cases in preference to heat. Most of you know that in years gone by, if a patient had a pelvic inflammation the application of cold was decried. The application of heat was the first effort of the general practitioner; he went so far as to entrust it to the members of the family, and as a result there was an invitation of blood into an already congested pelvis, with no means of relief of that congestion, and, as a consequence, there was a general peritonitis where a local peritonitis could have been secured. In the few moments allotted to me I shall not go deeply into the pathology, because time does not permit. I wish, however, to make this cardinal point, that nature must receive assistance in all forms of congestion. And what is that assistance? What will be the most effective way of keeping out, as far as possible, the blood which produces the congestion, which gets in by arterial force and cannot get out by venous relief? Another point I desire to make is this, that if we apply cold instead of heat, we do that which is to the nearest and best of our ability which nature calls for. We

relieve the congestion above, we circumscribe the septic condition below, and if we use the douches which the essayist recommends, we attract by the heat an extension of the condition to the lower structures in the pelvis, and we are able to reach them through the cul-de-sac. I have performed hysterectomy for septic conditions, but have regretted it very much. I have saved more women by the application of cold, which he recommends, and which we together teach and put into practice. I have not had, in late years, to make a hysterectomy in order to save a septic woman, but have been able to afford relief from below by making a free incision into the cul-de-sac, which takes off the pressure, and use cold above. Later on one can do surgery if he so desires. It is the cases of puerperal sepsis that I fear more than the gonorrhœal. I do not see deaths following gonorrhœal pelvic infection so frequently as I do from puerperal sepsis. Therefore, if we can in this Association instruct the general practitioner to guard against the dangers of the old-fashioned methods of treatment—that is, heat and poultices, to relieve pain, etc., and at the same time invite further extension of the trouble—we will have accomplished a great deal of good.

The paper is an interesting and instructive one, in that it points out to the general practitioners over the country that the "world do move," and we are getting on. We are able to deal with these cases more satisfactorily now than formerly, and I indorse most heartily the recommendations set forth in the paper of Dr. Boldt.

Dr. Joseph Taber Johnson, of Washington, D. C.—There is hardly any direction in which gynecological treatment has made a more favorable advance than in the treatment of endometritis. Formerly, these were the cases that came to the doctors' offices and were treated locally by the month and by the year, in one city and another, in one country and another, and were rarely ever cured. They were cases which Dr. Howard, of Baltimore, called "gynecological rotators," rotating around from one city to another. Endometritis occupies a middle ground between the diseases that affect the pelvic cavity and the vagina and adjacent parts. We have cases where it extends to the tubes and ovaries above and to the vagina and vulva below, the secretions from the endometritic uterus being sufficiently infectious to set up these diseases.

One of the greatest advances made in the treatment of endo-

metritis is the treatment by the curette, and in many of these cases, whether gonorrhœal or not, thorough curettement of the endometrium, thus rooting out the cause of the endometritis, and by proper irrigation and drainage afterward we bring about most rapid and successful results, thus doing away with the long-continued treatment which we formerly resorted to. It is rare, it seems to me, that we will be called upon to perform hysterectomy for the relief of endometritis unless it is of puerperal origin. When we have a case of uterine sepsis, which cannot be treated by any methods suggested short of hysterectomy, the remedy is almost as bad as the disease. Many cases of endometritis can be successfully dealt with by intra-uterine astringent irrigations and drainage, without resorting to so severe an operation as hysterectomy.

I regret very much that we did not hear that part of the paper which dealt with the pathology of the disease, in which we are rather lame. But I agree with everything Dr. Boldt has said except his suggestions in regard to hysterectomy.

Dr. Boldt (closing).—I wish to express my thanks to both Drs. Dudley and Johnson for their remarks. Of course, I had to leave a large portion of my paper out, on account of the time limit having been reached.

So far as the necessity for hysterectomy for non-septic endometritis is concerned, I should say it is one of the rarest occurrences. Occasionally, one might be compelled to resort to it, if hemorrhage cannot be arrested in any other way. The point which I desired to make especially was in reference to that class of cases ordinarily called septicæmia—patients who are ill with bacteriæmia. I maintain that, at the present time, we are not in a position to say in what patients such a severe operation is indicated. It is my firm belief, from careful observation of my own patients, where the bacteria are generally in the blood, they will die whether one operates or not. Furthermore, the question has occurred to me whether some of the patients who have been subjected to hysterectomy for puerperal sepsis or bacteriæmia might not have recovered without resorting to this operation. That has been my firm belief, and it is based not only upon clinical experience, but upon bacteriological investigations which I have made, being assisted by the members of my house staff. A number of times we have found pure streptococci in the blood, where there was no possibility of extraneous contamination, the most care-

ful antiseptic measures having been used to prevent such infection, and I have seen these patients get well without resorting to anything, excepting such ordinary every-day treatment, which should be in the hands of every general practitioner.

THE USE OF THE ELECTRIC CAUTERY CLAMP IN THE TREATMENT OF CANCER OF THE UTERUS.

By Charles P. Noble, M.D.,
Philadelphia.

I wish to present for your consideration a new adaptation of an old principle in the treatment of cancer of the uterus. The electric cautery clamp is a highly perfected and practicable instrument whereby it is entirely feasible to burn the attachments of the uterus and to leave not only a bloodless field, but one in which the lymphatics have been sealed by a thorough cooking or roasting process. Hysterectomy performed by means of the electric cautery clamp possesses all the advantages of any of the methods heretofore in use, and has in addition certain advantages peculiar to it alone. These special advantages are: 1. More tissue outside of the uterus is removed (or cooked) than by the classical methods. 2. All the connections of the uterus are severed either through tissue which has been cooked in the bite of the cautery clamp, or these connections have been severed with the electric cautery knife. In this way the lymphatic vessels are sealed either by the burning or the roasting process. Whatever the risk of implantation of cancer upon the field of operation may be, by this means it is greatly lessened or done away with. An exception to the above statements must be noted, in that the attachments of the bladder to the uterus are severed in the usual way. 3. Much less blood is lost than is usual

with the classical technique, and a dry, bloodless field is left after operation.

The history of the development of the electric cautery clamp is both instructive and interesting. As is well known, Dr. Thomas Keith,[1] of Edinburgh, used the clamp and cautery as a means of guarding against hemorrhage (a procedure originated by I. Baker Brown) from the pedicles left in his ovariotomy operations. The method which he employed was to clamp the pedicle with heavy forceps, and to cut the tumor away, leaving a button extending some distance beyond the clamp. An ordinary plumber's iron was heated in a plumber's stove and applied to the tissue beyond the clamp, and this was slowly burned down to the level of the clamp. In this way the clamps were heated sufficiently to thoroughly cook or roast the tissues within their grasp, reducing the tissues to a horny substance and obliterating the bloodvessels.

The late Dr. John Byrne,[2] of Brooklyn, for many years treated cancer of the cervix by amputating the cervix with the electric cautery knife, and then roasting the tissues adjacent to the cavity thus formed, with an electric cautery. The results which he reported were as good, if not better, than those secured by any other method.

Being thoroughly familiar with the work both of Keith and Byrne, and influenced by their results, the late Dr. Alexander J. C. Skene,[3] of Brooklyn, conceived the idea of applying the clamp and cautery method not only to the pedicles of intra-abdominal operations, but to hysterectomy for cancer, in this way making use of the advantages of the cooking process of Byrne in the more radical operation of hysterectomy. He devised a set of electric cautery clamps for cooking pedicles instead of using the clamp and

[1] Keith, T. Text-book of Abdominal Surgery, 1894, p. 359.

[2] Byrne, J. The President's Annual Address. Transactions of the American Gynecological Society, 1892, xvii. p. 3.

[3] Skene, A. J. C. Electrocautery as a Hæmostatic. New York Medical Journal, March 27, 1897.

cautery iron, as employed by Keith. The instruments devised by Skene did not work well in practice, and hence fell into disuse.

It remained for Dr. A. J. Downes,[1] of Philadelphia, to adopt the theories of his predecessors and to develop a thoroughly practicable electric cautery clamp. Dr. Downes uses the method wherever there are pedicles to deal with, having abandoned the ligature in favor of the cautery clamp. This feature of the electric cautery clamp may or may not appeal to surgeons in general, depending on their personal experience with the ligature. Dr. Downes claims as an advantage of the method, the elimination of the use of ligatures, in addition to the advantages enumerated above. He is entitled to great credit for his work in devising and perfecting these instruments.

The technique of hysterectomy by the electric cautery clamp method is as follows: The operation may begin either in the vagina or the abdomen. If the operation is begun below, the vaginal connections of the cervix are cut through with the electric cautery knife, and then (in cancer of the cervix) the cancerous mass is amputated with the cautery knife without opening the peritoneal cavity, if this can be avoided. Bleeding vessels may be clamped with ordinary forceps, or, if desired, may be sealed with the small-sized cautery clamp. The septic cervix is thus removed, the vagina resterilized, and, if desired, packed with gauze. The abdomen is then opened, the bowels packed off as usual with gauze, and the large-sized cautery clamp applied to the broad ligament outside of the ovary. By drawing up on the uterus and pushing down the bladder, the clamps may be made to grasp the tissues up to, and sometimes including, the uterine artery. If necessary to avoid its inclusion, the bladder may previously be detached

[1] Downes, A. J. Electrothermic Hæmostasis in Abdominal and Pelvic Surgery. Journal of the American Medical Association, August 17, 1901.

and pushed down. After the clamps are in position any blood is wiped away and the clamps thoroughly surrounded with gauze to protect other tissues from burning. The current is then turned on for thirty seconds, a forceps is placed toward the uterine end of the broad ligament to prevent reflux hemorrhage after the tissues are separated and the broad ligament is severed with a knife along the uterine side of the clamp. This step usually takes an additional half minute, during which time the cooking process continues, as the clamps retain their heat for some time. The clamp is then loosened and removed, and the cooked pedicle is allowed to retract. If no ligatures are to be used, great care must be taken not to handle or disturb this pedicle, as security against hemorrhage depends upon adherence to this rule. The opposite broad ligament is now treated in the same manner. This leaves the uterus connected with the broad ligament only at its cervical attachments. The bladder is now detached and pushed down in the usual way, and the clamps are made to grasp the broad ligaments alongside of the cervix down to the vagina. This portion of the broad ligament is treated in the same way as the upper borders. After the lateral attachments of the uterus have been cooked and severed, there remains only the connection of the uterus to Douglas' pouch to be severed. This can be caught in the clamp and cooked before being divided, and the uterus is then removed.

If the operation is begun with the abdomen, the technique must be varied when the vagina is reached, either by cutting through the vagina itself with the electric cautery knife, or by grasping the vagina in the cautery clamp in cooking the vaginal walls. Either method is quite feasible.

For the beginner, I would strongly recommend that the four arterial trunks be secured by ligature after the division of the cooked pedicles, lest inexperience with the method might lead to secondary hemorrhage. In one case I had occasion to regret not having followed this method, as a

sharp hemorrhage from the uterine artery largely contributed to the subsequent death of the patient.

I wish to call your attention to a new modification which I have used in two cases of hysterectomy for cancer. In my own practice, most of the primary fatal results in cancer have been due to septic peritonitis, and therefore the problem has been how to keep the peritoneum from becoming infected from the septic cervix. The proposed method is that, after dividing the broad ligaments down to and including the uterine arteries, the bladder is thoroughly detached and pushed down, and then the peritoneum on the posterior surface of the broad ligaments and in Douglas' pouch is detached from the cervix; then the healthy portion of the uterus is amputated and the cervical canal temporarily closed by suture. The bladder peritoneum is then sutured over the field of operation to the peritoneum of the posterior surface of the broad ligament and Douglas' pouch. Then a second row of sutures is used to more thoroughly turn in the field of operation. This connects the bladder with the rectum or whatever other peritoneum is most convenient for suturing. At this stage the abdomen is closed without greater danger of infection than occurs in any other abdominal section. The operation is concluded by placing the patient in the lithotomy position and by burning the vagina around the cervix, applying the cautery clamp to each side of the cervix and cooking the bases of the broad ligaments in this way, and removing the cervix per vaginam. The operation wound is thus entirely subperitoneal and can be drained into the vagina.

My experience with the use of the electric cautery clamp process embraces four hysterectomies for cancer of the uterus and one hysterectomy for inflammatory disease of both appendages with irregular hemorrhages, in a woman approaching the menopause. Had there been no question of cancer in this case, hysterectomy with supravaginal amputation of the cervix would have been the operation of election. In view of the history, it was considered wiser

to remove the entire uterus. Three of the cases of cancer made typically good recoveries. The fourth case died, mainly as a result of an accidental hemorrhage. The fifth case is now progressing toward recovery. This experience, while not large, is sufficient to convince me that the method has certain practical advantages. It guards against oozing hemorrhage from numerous small vessels, which is so annoying in cancer operations, and it leaves a dry field of operation to be buried under the peritoneal flaps. The special points in the method which appeal to me are: *First*, by its use, less blood is lost during operation; *second*, the lymphatics are sealed up, thus lessening the risk of septic absorption and implantation of cancer; and *third*, more of the broad ligament is removed than by other operation. If the ligature is used, the needle must be passed to the uterine side of the ureter, and fear of including the ureter inevitably tends to make the ligature hug the uterus. Not only is this true, but the button which is left requires that the broad ligament tissues shall be cut directly against the cervix. With the cautery clamp, at least one-third of an inch of tissue is cooked outside of the uterus, and the tissues beyond are more or less heated. This is an absolute advantage, unless experience shows a certain percentage of ureteral fistulas from cooking this structure.

The dates of the operations performed by myself are: October 5th, two cases; October 25th, one case; October 27th, one case; November 3d, one case.

Dr. Downes has used the method in cancer of the uterus of his own patients in two vaginal hysterectomies, two vagino-abdominal hysterectomies, and one abdominal hysterectomy. Also in one vagino-abdominal hysterectomy operated on for Dr. Hirst, and two abdominal hysterectomies operated on for Dr. Kelly.

Some years must elapse before the actual value of the electric cautery clamp in the treatment of cancer of the uterus can be determined, but in view of the results secured by Byrne and of the positive theoretical advantages it has

over the ligature method, it is reasonable to expect that it will give us a larger percentage of cures than the older methods, more especially in cancer of the cervix. The fact that such operators as Jacobs, of Brussels, and MacMonagle, of San Francisco, report large series of cases of cancer of the cervix, operated upon by vaginal hysterectomy, without a single cure, that Baldy, in his recent summary of results, estimates the cures from hysterectomy for cancer of the cervix at only 5 per cent., and that there is a general concord among writers that 10 per cent. is a fair average for cures, makes it incumbent upon us to give a fair trial to any method which does not increase the primary mortality from operation and which gives promise of improving the ultimate results.

DISCUSSION.

Dr. W. D. Haggard, Jr., of Nashville.—This is an important contribution, because it is directed toward a malady the treatment of which has been very unsatisfactory by the present known surgical methods. I presume there is not a Fellow here who is satisfied with the remote results of uniform extirpation for malignant disease of the cervix. Many of us remember the Presidential address of Dr. Byrne before the American Gynecological Society, in which attention was directed to his hitherto unparalleled results by the cautery. I think most everyone since has felt that success from methods of extirpation by the knife, the clamp, or by the ligature has not been gratifying, and that something that would destroy tissue to which we could get easy access was desirable. Dr. Noble expressed the fear that it would require some years to determine whether this method is going to be available. It seems to me, however, that anything which will tend to make a large eschar, and in that way destroy tissue that cannot otherwise be reached, is going to be a decided gain. Personally, in my own work, hysterectomy is done with the clamp, and I have adopted the suggestion latterly of heating the clamps hot with the ordinary soldering iron, so that in that manner I am enabled to get a further eschar.

I saw one objection to one instrument which appeared in

the releasing lever that holds the angiotribe. I should think it would be quite difficult to release the lever, and if so, it would very likely do harm in disturbing the stump and producing possibly a secondary hemorrhage at the time.

We are under obligations to Dr. Noble for bringing this method to the attention of the members of the Association.

Dr. George J. Engelmann, of Boston.—I understood the essayist to say that the instrument of Dr. Skene has been laid aside. This is a surprise to me as I have seen it used abroad, and Dr. Jacobs, who is an expert operator, has had that very instrument made in preference to any of the more recent foreign ones. It is superior to them; it is lighter, more easily handled, and takes the place of those more clumsy instruments. So enthusiastic was Dr. Jacobs with regard to this invention of Dr. Skene's that I am convinced that others have followed in the wake of this skilful operator, at all events we could hardly say that the instrument has been laid aside.

Dr. Thaddeus A. Reamy, of Cincinnati.—The paper of Dr. Noble is very instructive, and, as has been stated, it is a valuable contribution. During the reading of it and during the remarks that have been made since, it occurs to me that it is not too late for us to remember the results obtained by Byrne in the treatment of cancer of the cervix by cautery and knife. The results obtained by him almost exclusively with the use of the cautery, even now, have not been recognized as they should.

The success of the Byrne method of treating cancer or the cervix lay very largely in thoroughly cooking the tissues, along with the aseptic and antiseptic influence of the heat penetrating into the structures beyond the cooking, invading suspicious ground where the cancerous invasion stops and sound tissue exists. The cooking process with electricity is rapid. The facilities are great. The great object of the work with the cautery is the painstaking application of the instrument, heating and cooking the tissues so thoroughly as to destroy the cancerous areas or zones of involvement.

I have had the honor of publishing two papers on the subject of surgical intervention in cancer of the uterus and of the cervix. It seems to me, at the present time we can only be guided by the clinical evidence as to whether the cancer is confined to the body of the cervix or not. How many cases are cured by treatment of cancer involving the intravaginal

portion of the cervix, to say nothing of the pavement epithelium or columnar epithelium going in the other direction? How many cases are cured locally by caustics and knife, and how many are cured by hysterectomy? Probably only 5 per cent. of all cases met with. I venture to say that not more than 5 per cent. of selected cases, where the treatment was confined to the cervix, were cured in days gone by; but I believe a larger percentage of the cases can be cured by that method now. I will not refer to the cases I have reported, because most of you are familiar with my contributions. However, I will say this, that if I am in good physical condition next year I may give you the results of my latest work.

Dr. L. S. McMurtry, of Louisville.—I want to call attention to one point apropos of what Dr. Reamy has said, and that is this: The method that has been described in the paper is a continuation of the work along the line which Dr. Reamy advocates. It is along the line of treatment advocated and practised by Byrne; at the same time, more thorough work is urged than has heretofore been done by reason of the improved technique in pelvic surgery. We cannot only make use of the cautery, but we can proceed and remove the uterus close to the peritoneum, and make a complete and thorough operation, so it is but an extension on modern lines of the very principles Dr. Reamy has advocated for so many years.

Dr. Joseph Price, of Philadelphia.—As gynecologists we have done much to control this dreadful disease (carcinoma), and we have made considerable progress. Some of you may remember that Sims was invited by Dr. Oliver Wendell Holmes to lecture to his class in Boston, and he selected this subject for discussion, "The Curette and Cautery." Later, Byrne took it up and practised it with more or less success. Sims recognized its value, but it was not the only method of treatment for cancer in these regions. If we use the curette and cautery freely, cook the tissues thoroughly and deeply, we will accomplish much. But very few practitioners know how to cook the tissues as thoroughly as Byrne did, either with the electric cautery, soldering irons, or the modern instrument. We know from a long and vast experience that the cautery has always been of great value. When we give these sufferers, these dying women, with copious hemorrhages and discharges contaminating the atmosphere of homes, and arrest exhaustion due to hemorrhages and discharges, the relief we accomplish

is great and an incalculable amount of good is done. We prolong their lives. Even the imperfect method of the use of the curette and cautery has prolonged lives. It has been used in a class of hopeless cases. If you take a case of cancer in which the disease has reached the vagina, and the vagina is fixed quite to the pubic arch, if you use the curette freely and then cook the tissues with the cautery, you will have a conical cicatrix in the vaginal vault, and your patient may live in peace for six months longer than she otherwise would live.

Credit for the application of the cautery should be given to Baker Brown.

A wet blanket has been thrown upon hysterectomy. It is rather unfortunate that non-operative intervention should be recommended or advocated for cancer of the cervix, etc. It is said that the average life of a Harvard graduate is only forty-six years. Malignancy commonly develops at that age. We operate on thousands and thousands of these women, and if we extirpate their cancerous uteri at that age we prolong their lives four, six, and even eight years. I have hundreds of them upon whom I have operated, and who, I am told, have lived three and four years after operations. I have patients in Danville and Petersburg, Va., also in Warren, Ohio, whose lives have been prolonged for many, many months and years. If we can put these women in an uncontaminated atmosphere, we accomplish great good. I do not refuse operative intervention on patients, notwithstanding the disease may have reached to the ureter.

Dr. Noble makes a criticism of the forceps operation. The forceps operation was a little in advance of the common cautery operation. With the forceps operation we get farther from the uterus and zones of invasion.

What Dr. Noble said in regard to the ligature method is true. The ligature slips off of the back planes of the uterus, and it is an incomplete procedure. Aside from the slough in the bite of the forceps, the instrument recommended by Dr. Noble is a step in advance of the forceps. I would emphasize the importance of any method which will relieve suffering women of this dreadful disease. I welcome this paper, because it is far in advance of everything as yet recommended. I am satisfied that this procedure will be made more perfect and will be practised with perfect safety even by those who want to do vaginal hysterectomy.

Dr. Hermann J. Boldt, of New York City.—I fully indorse the using of heat upon the broad ligaments for the purpose of extirpating the uterus for cancer. I would say, however, in regard to the degree of heat which is used, that my good friend, the late Dr. Byrne, was kind enough some years ago to demonstrate his method to me, and subsequently I had a motor and regulator made, so that I could use the constant current. With the regulator (and it is very important to regulate the degree of heat) we can determine the intensity that we wish. It is of the utmost importance, as Dr. Byrne pointed out in the papers which he read upon the subject, not to use too great a degree of heat—a dull red heat. From what I understand, the clamp which Dr. Noble presented is heated in ten seconds to a red heat. There is no occasion for that.

Dr. Noble.—It never gets red.

Dr. Boldt.—With the utmost precautions there is danger of injuring the ureters. I do not remember exactly, but some three years ago, when I did a hysterectomy for cancer which was far advanced and complicated by fibromyoma of the uterus, where I wished to employ heat, and took all the precautions possible to wall off the area about the field of operation with gauze, yet, on the second day subsequent to the operation one ureter sloughed through, and on the third day the other ureter sloughed, so that I had a double ureteral fistula as the result of the heat. The patient was subsequently compelled to have a nephrectomy done on one side, with implantation of the ureter on the other side. Notwithstanding this, there is no question with regard to the desirability of using heat.

I can indorse what Dr. Reamy has said and what the late Dr. Byrne said.

Dr. Alexander Hugh Ferguson, of Chicago.—I have only a few words to say in connection with the excellent paper of Dr. Noble. I would draw attention to lymphatic involvement in connection with carcinoma of the cervix, and the manner of determining, while doing vaginal hysterectomy, whether these lymphatics are enlarged or not. It has been clearly demonstrated by Emil Ries, Howard Kelly, and other men that sometimes in carcinoma of the cervix the appearance of the cervix is insignificant, yet we get involvement of the iliac lymphatic glands. It is necessary always in other conditions of the

patient to do a radical operation in those cases. I have resorted to a procedure for diagnosis which I wish to mention. After removing the uterus, split the vagina laterally on both sides, which makes the vagina very dilatable, so that you can make it just as large as a vagina after childbirth. *Then pass in the hand and explore the whole abdomen.* I passed in my hand in one case beyond the elbow, and found gallstones in the gall-bladder, and through a buttonhole slipped the gallstones out. The vagina was too small to admit my hand without splitting it laterally. In another case I found the lymphatic glands enlarged, and removed them through a suprapubic incision.

Dr. Noble (closing).—I am very much pleased with the reception of my paper. As I stated in the beginning of it, it is not my bent to be pleased with novelties, and, as a matter of fact, the only thing novel about this is the perfection of the instrument with which to apply this old principle. I, like everyone else who has thought much about cancer, have been impressed with the good results which Byrne has obtained with the use of the cautery, and in my own work, in doing hysterectomy for cancer, I have always used the cautery in the vagina. Some years ago I reported my results in cancer, and I believe the reason why the percentage of cures which I have had is a little higher than the average is because I have used the cautery for years in the vaginal part of the work. When Dr. Downes perfected this instrument I immediately determined to use it.

Let me take up some of the points which were raised in the discussion. The first one was as to the difficulty of using these instruments. The difficulty is largely because one is not familiar with them. I remember the first time I used them I was very awkward, because I was opposed to what I called plumber's tools, which many of our operators use, as the angiotribe, and such instruments. They seemed to me to be clumsy for surgeons. The angiotribe naturally felt clumsy to me. One must get experience in the use of heavy instruments. He has to learn how to use an instrument before he can do it well. This entire instrument is made in one factory, so that the same men can repair them. It is quite simple to repair them, and it is inexpensive, if they get out of order. Another satisfactory thing about the instrument is that of the three sizes of the instrument and of the electric cautery knife;

each has exactly the same amount of platinum in it; therefore, the same current which will heat one will heat the other. The thing has been worked out to a practical basis.

The point raised by Dr. Reamy and Dr. McMurtry were really dwelt on in the paper, namely, that this is nothing new, but simply an extension of the principle of heat used in the old partial operation extended to the operation of hysterectomy; therefore, we should get all the advantages of the old operation plus the occasional advantage of removing the corpus of the uterus, which is involved.

I am obliged to Dr. Price for calling my attention to the oversight of not giving Baker Brown the credit for the first use of the cautery.

The points raised by Dr. Ferguson, that early in cancer of the cervix involvement of the distant lymphatics is frequent, I believe is an error. It is true, that occasionally the distant lymphatics are involved, but, as a matter of fact, they are seldom involved in the late cases. In patients who die of cancer, as a rule, the distant lymphatics are not involved. Therefore, that is the reason why the so-called Rumpf-Ries-Clark operation is falling into disuse, because it was based upon this theory of involvement of the distant lymphatics; whereas, experience and practice have shown that it is an error, and that the operation is entirely too extensive for ordinary cases. More women will die owing to the high primary mortality than if it is not employed, so that I think that particular point, if I am correctly informed, is not well taken.

Dr. Downes does not use the ligature at all, but uses this instrument for all sorts of surgery where most of us use the ligature. I do not intend to abandon the ligature in cancer operations, although I have seen him do the operation with no ligatures.

A STUDY OF ADRENAL GROWTHS.

By James E. Thompson, M.D.,
Galveston, Texas.

The paper that I have the honor of reading before your honorable body ought more properly to be entitled a "Study of three cases of tumor of the kidney supposed to be derived from adrenal tissue."

It will be seen from the remarks that follow, that I am not quite clear in my own mind that the growths are truly derived from this tissue. In only one case am I convinced enough to make a fight even to place it among these interesting tumors (Case II.). In the other two cases the evidence is so conflicting that I merely put the case as strongly as possible, and leave the summing up to be done by some pathologist better acquainted with the subject than myself.

All the cases were removed by operation from the living subject.

One of them died from the effect of the operation (Case II.), and, unfortunately, the post-mortem records do not mention whether there was an adrenal body present on the same side. This is to be regretted, because this is the very case that is microscopically and clinically more of an adrenal tumor than the others. The clinical histories of Cases II. and III. correspond accurately with those that have been described in this class of cases. They both occurred in patients over fifty years old. They were unattended by any marked urinary symptoms; the macroscopic features were the same—*i. e.*, a localized growth of a yellowish-white color, with deeper parts of a mucoid or gelatinous appearance.

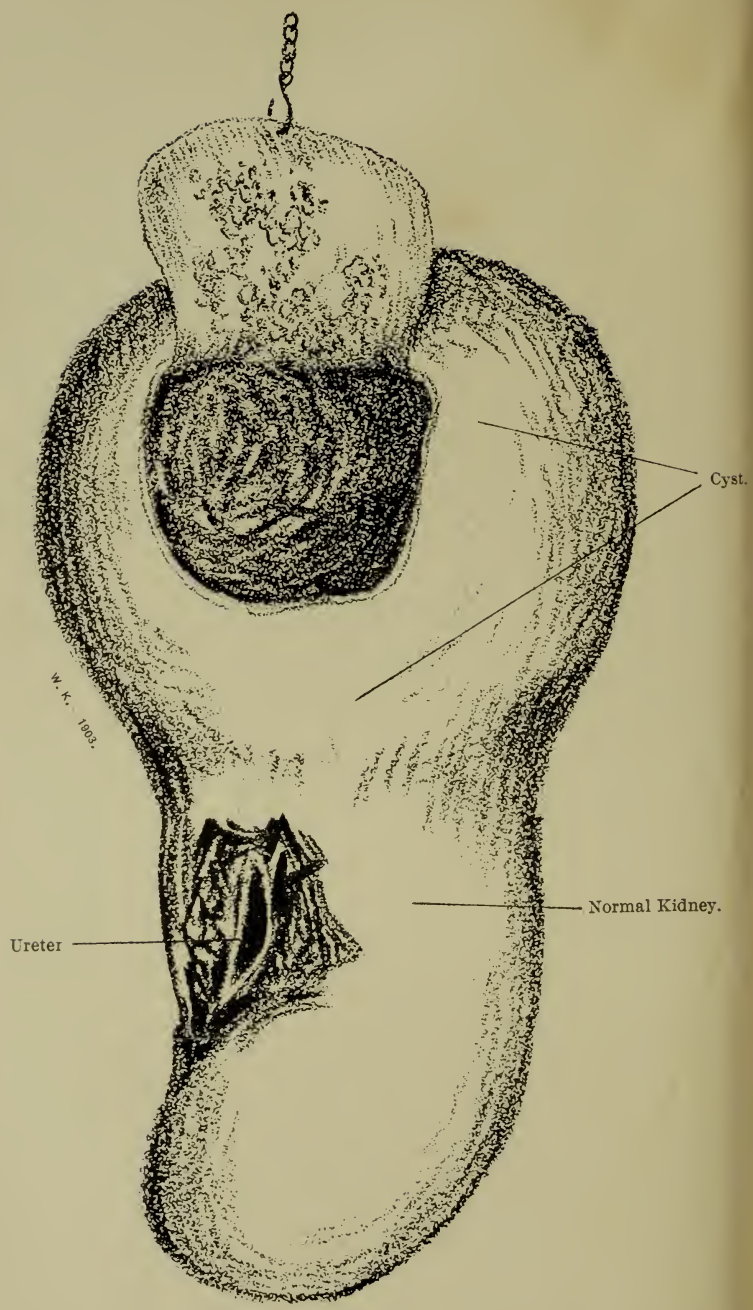
The histories are as follows:

CASE I.—Julius N., white, aged sixty-three years, came under my care in October, 1896, complaining of the following symptoms: He gave a previous history of severe cystitis about twenty years ago; also malarial fever contracted in South America. Present illness commenced two months ago with pain in the bowels, which led to the discovery of a movable lump in the left side. This has never been the seat of pain.

Present Condition. Frequent nocturnal micturitions troubled him. They are probably due to an enlargement of the prostate. The urine is normal. Below the left costal margin a freely movable swelling was found, which on pressure disappeared under the ribs. It occupied the upper part of the left lumbar region, and could be freely palpated with the hands. Resonance was detected over the anterior surface and outer border of the swelling, but was absent in the loin. Splenic dulness was wanting. Palpation showed a slightly nodular surface, but no fluctuating spots. The growth appeared to roll under the hands. A diagnosis of "movable kidney probably the seat of a growth" was made. An exploratory operation was decided upon.

On October 5th the abdomen was opened by a vertical incision over the most prominent part of the growth. It at once presented, and was seen to be covered in front by the descending mesocolon. The descending colon, after being released by an incision along its outer border, was drawn toward the middle line. The growth was then fully exposed. It had a pointed end, somewhat like a pear, and it appeared to be cystic. A trocar and canula passed into it allowed pure cholesterin to flow out. The cyst, which was as large as a fist, was opened and the contents emptied. It was found to occupy the lower end of the kidney. The upper end of the kidney was in its normal position, and was fixed, while the lower end with the cyst was allowed a considerable degree of movement.

PLATE I.



The kidney and cyst really oscillated on the pivotal attachment of the upper end. The kidney and cyst were removed. The stump was touched with the thermocautery and dropped into the retroperitoneal space, which was closed with a few points of suture. The abdominal incision was completely closed.

The patient suffered somewhat from shock for a few hours, but quickly reacted. By night the skin and kidneys were acting freely.

The following shows the analysis of the urine passed during seven days following the operation:

First day: Urine, 23 ounces; urea, 5½ grs. to 1 ounce.
Second day: Urine, 23 ounces; urea, 12½ grs. to 1 ounce.
Third day: Urine, 24 ounces; urea, 12 grs. to 1 ounce.
Fourth day: Urine, 24 ounces; urea, 15 grs. to 1 ounce.
Fifth day: Urine, 29 ounces; urea, 13½ grs. to 1 ounce.
Sixth day: Urine, 21 ounces; urea, 14½ grs. to 1 ounce.
Seventh day: Urine, 20 ounces; urea, 15½ grs. to 1 ounce.

The urine at first contained albumin in large quantity, blood and casts (pale, granular, and hyaline). On the fifth day the albumin showed a decrease, which continued daily, until at the end of three weeks only a small trace of albumin was present.

The specimen (Plate I.) consists of a left kidney containing a cyst the size of an orange at the lower pole. The wall of the cyst is thin and resembles parchment. The upper part of the wall is formed by the kidney proper, and the part that faces the cyst is nodular and distinctly papillomatous. The contents consist of pure cholesterin.

A section of the kidney in the neighborhood of the cyst shows a gradual transition from normal kidney tissue to the nodulated papillomatous edge. Microscopically the growth shows the following points : A section was cut, having the free edge in the cyst, and the other end well into healthy kidney tissue. The transition from normal kidney elements is very gradual. About 1 c.m. from the free edge the tubules begin to show an irregular arrange-

ment. They appear to be lined by the same epithelium as the convoluted tubules. The lumina are greatly dilated, and in most cases are filled with blood (Fig. 1). They contain also some peculiar large cells, distinctly nucleated and containing a very granular protoplasm (Fig. 2). These cells are very numerous, and show very distinctly in all specimens stained with hæmatoxylin and eosin. Many of the tubules are greatly dilated and closely massed together (Fig. 2). Instead of the walls being formed of cubical cells (Fig. 1), they seem to have been flattened; and in the specimens examined, although the nuclei could be observed, the outlines of the cells were very hard to differentiate. This can be well seen in Fig. 2, which suggests somewhat the appearance of an angeioma. The amount of blood present in the specimen is very noticeable. In some places it is present in the intertubular spaces, and seems to permeate the specimen. The large cells depicted in the interior of the tubules were found only in the tubules, and not in the intertubular tissue.

The diagnosis of the growth is "adenomatous cyst of the kidney." The presence of cholesterin is a peculiar feature which I am unable to explain.

Case II.—H. G., aged sixty-eight years, laborer. Admitted to hospital May 27, 1900. The notes of this case were lost in the Galveston storm, and, with the exception of the post-mortem records and some few that I had in my own keeping, the greater part are missing He was operated on June 2d and died on June 5th.

The history is as follows: He complained of intense pain in the right loin. Urination was painful, and the urine contained pus in fair quantity. The pathologist made an examination for tubercle bacilli and sent in a report that was a little uncertain on account of the peculiar staining properties of the bacilli. A swelling was observed in the right loin, which was freely palpable, and could be moved from side to side and from above downward. It

FIG. 1.

CASE I. Obj. No. 7 a. Eye-piece, No. 4.

FIG. 2.

CASE I. Zeiss. Obj. c. Eye-piece, No. 4.

filled the loin, and the ascending colon was in front of it. A diagnosis of "movable kidney probably affected with tuberculosis" was made.

Operation was performed on June 2d. The kidney was exposed by Koenig's incision and partially delivered on the loin. At the lower end a swelling was seen, which had the appearance of gummatous material. It was thought necessary to remove the whole organ. The renal vessels were ligated with silk and the organ removed. No drainage was used. The patient never recovered from the operation. About one-fourth the normal amount of urine was secreted. He died on June 5th. (I regret that the records of the amount of urine passed after the operation were lost.)

Post-mortem Examination. The left kidney was smaller than normal, very firm, red in color, irregular in outline, capsule adherent, and surface red and granular. On section, the pelvis and pyramidal tissues were infiltrated with fat. The cortex was thin and was well outlined from the medulla, and the pyramids were more or less distorted from chronic inflammatory changes.

The bladder exhibited evidences of a mild chronic cystitis. The lungs showed hypostatic congestion; about the roots and apices of both lungs tubercular nodules were seen. The entire upper lobe of the right lung and the apex of the left lung were adherent to the parietal pleura. The pericardium contained about 10 c.c. of straw-colored fluid. The surface was normal. The substance of the heart showed fatty infiltration. There was slight calcification about the bases of the aortic valves. The endocardium was normal.

Description of Specimen Removed. Specimen consists of a right kidney of apparent normal structure, the lower fourth of which is occupied by a yellowish mass of a chamois leather-like appearance, mottled in places with white and red patches. In consistence it is firm. There are no cystic spaces or evidences of hemorrhages. The

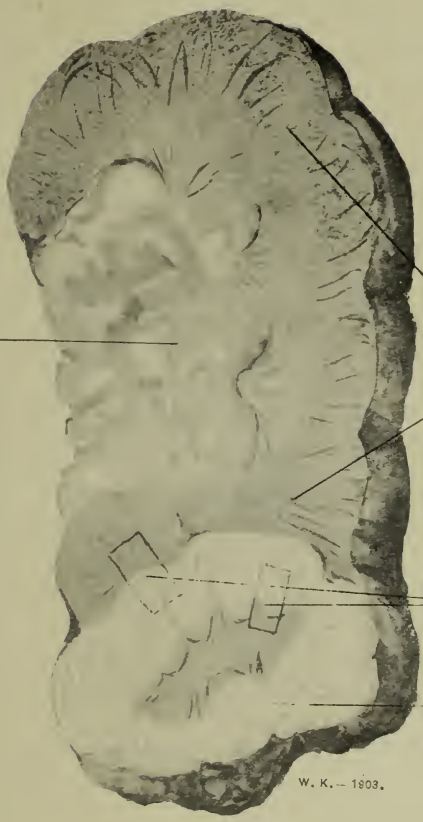
outer surface is slightly nodular. A slight groove separates the tumor from the normal kidney. On the cut surface of the specimen the line of demarcation between the tumor and the kidney is abrupt, and is marked by a narrow layer of dense tissue. The growth does not extend into the pelvis of the kidney.

Microscopic Examination. Two specimens were removed for microscopic examination. The places are shown in Plate II. The one consisting of both kidney and tumor will be studied in detail. The other, consisting of tumor only, to be afterwards referred to. A rough representation of this specimen under a low power is shown in a diagrammatic manner in Fig. 3. The dense tissue is shown occupying the space between the normal kidney and the tumor. The kidney near the dense fibrous tissue consists of an irregularly arranged mass of convoluted and straight tubules. The nearer the cortex the more the convoluted tubules predominate, and in some specimens a few glomeruli can be seen.

The dense fibrous tissue consists of white fibres and long spindle cells. In places there are a few tubules, with the lumina obliterated by pressure, and the cells squeezed almost out of recognition. They look like the cell nests in a very hard scirrhus. Near the tumor edge of this band the nests are no longer found.

The tumor starts abruptly. It consists of a mass of tubules separated by very little intercellular tissue. A representation very highly magnified is shown in Fig. 4. The arrangement is distinctly alveolar, although in many alveoli the central space is represented merely by a fissure. The cells lining the alveoli are one layer deep; the outlines are in places very indistinct (Fig. 5), although with care the boundaries of the different cells can be made out. The cells are cubical or columnar in general arrangement, and each possesses a well-marked granular nucleus (Fig. 5). The protoplasm is markedly granular. In some parts the interstitial tissue contains nests of

PLATE II.


Fat in renal sinus.
Normal kidney.
Here pieces were taken for microscopic examination.
Tumor.
W. K. — 1903.

round cells (Fig. 4). A highly-magnified representation of an alveolus is shown in Fig. 5. Here the central lumen is shown by a dark fissure, around which are arranged the irregular cubical cells with well-marked granular nuclei. It is difficult to follow the boundaries of individual cells as far as the basement membrane. The drawing is an accurate picture of one particular alveolus. The grouping of the alveoli is very regular. From one end of the specimen to the other there is no variation, and a drawing of one part would equally represent another. Examination of the specimen that came from the centre of the tumor is uniform with the description of the tumor above given. This tumor corresponds exactly with that described and figured in Bland Sutton's work on *Tumors*, in Figs. 86 and 87.

The bloodvessels are very numerous. In places they exist as enormous spaces filled with blood. In other parts of the specimen the red blood cells are pencilled out of the vessel. The walls are thin but very distinct in outline. In some cases a few nuclei can be discovered, but, as a rule, the walls look like those separating the alveoli. In some parts of the specimen there are extensive hemorrhages between the alveoli.

Case III.—Mrs. R. E. R., aged fifty-five years; mother of nine children; has had four miscarriages. Her life has been a hard one, but she has always enjoyed good health. Digestion has been good until the last year or two. Had been chronically constipated for several years. Habits have been always good.

Present Disease. About three years ago a lump appeared in the right side below the margin of the ribs. It came a few weeks after being thrown from a horse. The swelling has varied from time to time. Pain is usually of a dull, aching character with a sensation of weight, but at times it is very severe and lancinating. The swelling has shown a gradual increase in size. Troubles in urination began during the last few weeks. There is no history

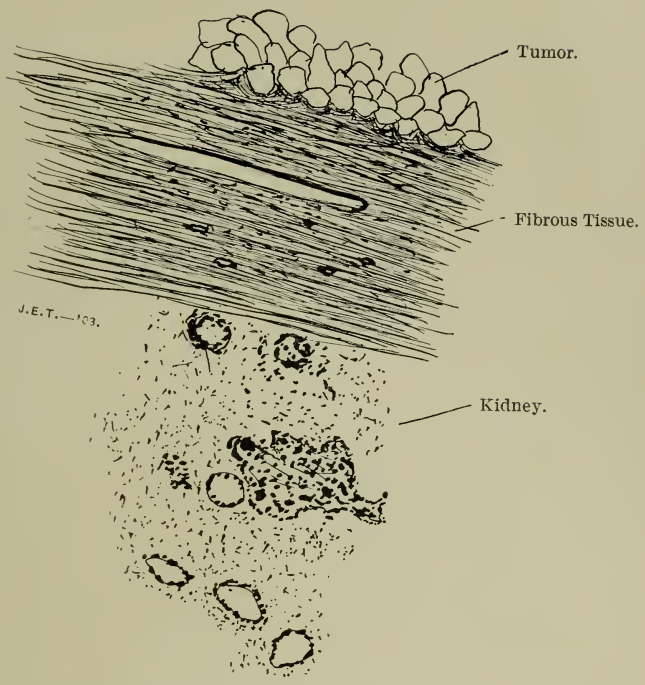
of hepatic or renal colic. She has suffered from severe and constant pain in the region of the right kidney. There has also been a slight loss of weight.

Present Condition. The patient is a woman of frail build, of dark complexion, slightly emaciated body, and flabby muscles. She lies in bed inert, and complains of difficulty in moving herself. Decubitus is on the right side and back. She complains of a cold, dead feeling in her legs. The lungs and heart are normal. The liver dulness extends half an inch below the lower margin of the ribs. Spleen is normal. Region of the intestines is slightly tympanitic. In the right loin a swelling can be distinctly palpated. It extends from the liver dulness above to the crest of the ilium below; and from the loin behind (which it fills) to a point about three inches from the middle line in front. It is slightly nodular, but no soft spots can be detected. The colon can be percussed along the anterior and inner part of the swelling. Inflation of the colon shows the tumor to be placed behind it in the cavity of the loin. The swelling moves a little with respiration, otherwise the range of movement is rather limited. When she lies on her left side she complains of severe dragging pains in the region of the tumor. On urinating she complains of pains in the loin and back. Since admission she complains of more and more difficulty in moving her legs.

Examination of the Urine. This was taken from a specimen passed on January 23d. Total amount passed in twenty-four hours, 23 ounces; character, deep amber; odor, normal specific gravity, 1018; reaction, acid; sugar, none; albumin, slight amount by trichloracetic acid, doubtful by nitric; sediment, rather heavy and pale; very much indican; diazo reaction negative.

Microscopic examination showed much mucus, a few bladder cells, a few pus cells, a few hyaline casts, and a very few epithelial casts. Under local anæsthesia, segregation was performed. Peculiar features were found.

Fig. 3.

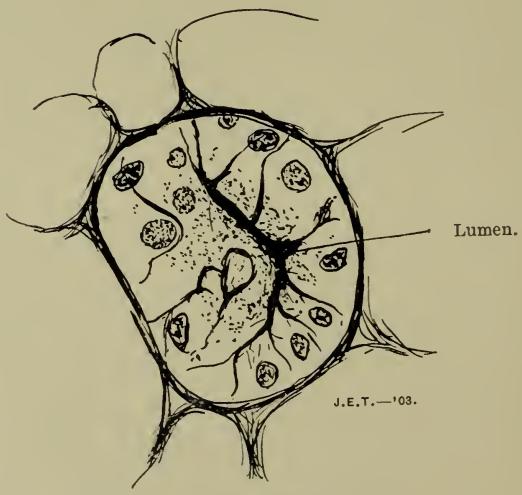


Case II. Reichert. Obj. No. 3. Eye-piece, No. 2.

FIG. 4.

CASE II. Zeiss. Obj. c. Eye-piece, No. 4.

FIG. 5.



CASE II. Zeiss. Obj. e. Eye-piece, No. 4.

Twice as much urine came from the right (affected) side than from the left; also, there was more pus and blood than were present in the urine drawn off by the catheter. The segregation was repeated again with the same result.

Since admission, the muscular weakness present in the lower extremities has developed into a distinct paralysis. The patient is now unable to move the lower extremities. She retains control of her urine and rectum, but she cannot feel a pin-prick in her legs. The line of anæsthesia begins at the level of the second lumbar nerve on each side. The reflexes are abolished. Her condition otherwise is very good.

I hesitated about operating, because I felt certain that the paralysis was caused by a secondary deposit in the spinal canal or vertebræ. The patient and her friends, however, persuaded me to operate against my better judgment.

Operation. This was performed on January 27th. Chloroform was the anæsthetic. The kidney was exposed by Koenig's incision. It was much enlarged, and was separated with difficulty from the perirenal tissue, especially at the lower end. At this end, where there was the appearance of a large cyst; an aspirator was introduced, but nothing but blood was withdrawn. From the puncture the hemorrhage was so severe that I tried in vain to stop it. I was forced to remove the kidney, which was easily accomplished. The vessels were secured with clamps, which were left on for three days. The patient made a satisfactory recovery from the operation. The other kidney responded to the needs of the patient and secreted enough urea.

I append below a series of analyses of the urine before and after:

January 23d. Urine passed, 23 ounces: urea, 2.9 grms. per 100 c.c.

25th. Urine passed, 16 ounces; urea, not recorded.

26th. Urine passed, 26 ounces; urea, 3.1 grms. per 100 c.c.

27th. Urine passed, 16 ounces; urea, not recorded. This was the day of operation. Eleven ounces were passed before operation, which was over at 10 A.M., and 5 ounces after.

28th. Urine passed, 12½ ounces; urea, not recorded.

29th. Urine passed, 15 ounces; urea, 3.5 grms. per 100 c.c.

30th. Urine passed, 20 ounces; urea, not recorded.

31st. Urine passed, 21 ounces; urea, 2.7 grms. per 100 c.c.

February 1st. Urine passed, 24 ounces; urea, 2.6 grms. per 100 c. c.

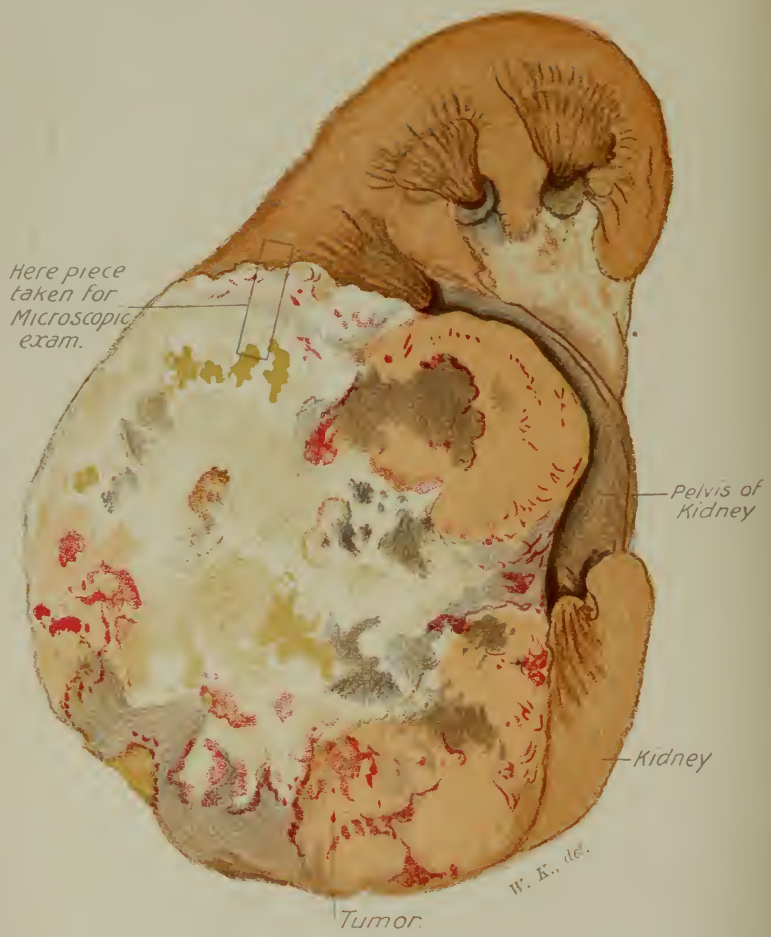
2d. Urine passed, 20½ ounces; urea, 2.3 grms. per 100 c.c.

As was expected, the paralysis did not improve. The irritability of the muscles, which at first responded to the faradic current, eventually disappeared, and could be elicited with difficulty by the galvanic. Bed-sores appeared on the buttocks, over the sacrum, and, toward the last, over any part that was subjected to pressure. The patient left for home on April 3d with the operation wound closed, but with several large bed-sores present. There is no doubt that the cause of the paralysis is a secondary deposit in the spine.

Description of the Specimen. The specimen consists of a right kidney, having at its lower end a large globular, pultaceous swelling as large as an orange. The tumor, which is shown in Plate III., is much larger than the kidney. Its outline is sinuous, and the boundary between it and the kidney is sharply defined. The growth occupies the lower and outer surface of the mass, and touches the surface along the greater part of its convex border. A part of it projects into the pelvis of the kidney. This is quite smooth and shows no evidence of abrasion.

The capsule of the kidney passes directly into that

PLATE III.


Here piece
taken for
Microscopic
exam.
Pelvis of
Kidney
Kidney
Tumor.
W. K., del.

covering the growth. The color of the growth varies. A large part of it is yellow in color, but interspersed among it are streaks of red. The portion lining the pelvis of the kidney is flesh-colored, as is also a portion passing from it downward to the lower and cortical part. This part has also flesh-colored streaks running through it. The yellow is that of chamois leather. In consistence it is fairly firm; but scattered through it are softened areas of a mucoid, pultaceous material, of a whitish, jelly consistency. They looked like spots of mucoid degeneration. The whole growth was very vascular. An examination of the outer surface showed an area the size of a dollar where the growth had been torn during removal.

Microscopic Features. A section was cut (see Plate III.) including parts of kidney, boundary line, and tumor. The tubules of the kidney were normally formed. In some parts of the specimen straight, in others convoluted tubules preponderated. Between the tubules there was a marked accumulation of round cells, such as are met with in interstitial inflammation.

At the boundary line the kidney tubules ceased abruptly, and a dense fibrous tissue, similar to that depicted in Fig. 3, took its place. It was not so regular nor so dense as that in Fig. 3. It was permeated with numerous round cells, and in places one found spaces containing cells of a peculiar nature, depicted in Fig. 6, A. These cells are contained in a cavity (alveolus), are irregular in shape, with slightly branched processes. They contain a large nucleus and granular protoplasm. In one part of the specimen, near the boundary line, a few alveoli were seen, having as contents cells shown in Fig. 6, B. These cells are well formed and completely fill the alveolus. They possess a well-formed nucleus, which stains very clearly with hæmatoxylin. Both groups of cells above mentioned look like epithelial cells. Those in B are, however, more like them than those marked A, which might easily pass for large cells in a sarcomatous growth.

As we pass further in the tumor mass, the A cells become more numerous, then gradually disappear, giving place to smaller ones, of a round-celled type, distributed (Figs. 7 and 8) in the alveolar spaces, and forming a perfect picture of an alveolar round-celled sarcoma. In one section of the tumor, taken near the junction of tumor and kidney cortex, the peculiar appearances shown in Fig. 9 were observed. This specimen shows a well-formed bloodvessel passing through a group of alveoli. These are perfectly defined, the walls are distinct, and consist of spindle cells and white fibres. The contained cells are very loosely packed, have very indefinite outlines, so that only the granular nuclei are evident. The nuclei are shown in Fig. 9, but the cell outlines are not seen. In fact, even under a very high power the outlines were very indistinct. In some few spots individual cells could be seen, and they are shown separately, highly magnified, in the lower part of the figure. This part of the specimen looks more of an epithelial nature than the rest, and the alveolar arrangement reminds one a little of that in Fig. 4. It is, however, too great a stretch of the imagination to draw a strict analogy between the poorly-formed cells of Fig. 9 and the magnificent individual cells of Fig. 5.

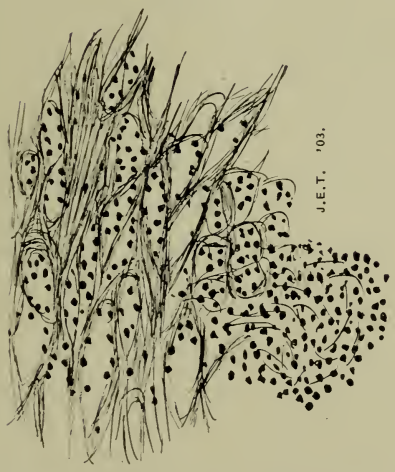
The most characteristic portions of the tumor are shown in Fig. 8. This cannot be interpreted as anything but an alveolar sarcoma. However, in many parts of this alveolar growth, the trabeculæ, which stain intensely with eosin, have in contact with them a number of irregular cells, also staining intensely with eosin, that seem to be attached to the sides of the trabeculæ. These are, in shape and other characteristics, like those shown in Fig. 6, A. They are only one layer deep, and although something like the cells depicted by Aloysius Kelly in his monograph in Figs. 6 and 7, the trabeculæ in our case are not capillaries, and the growths, although like one another in their gross characteristics, are very unlike.

The extreme inner edge of the section, which was sit-

FIG. 6.

CASE III. Reichert. Obj. No. 7 a. Eye-piece, No. 4.

FIG. 7.



CASE III. Reichert. Obj. 3. Eye-piece, No. 4.

FIG. 8.

CASE III. Zeiss. Obj. c. Eye-piece, No. 4.

FIG. 9.

CASE III. Zeiss. Obj. c. Eye-piece, No. 4.

uated in the mucoid material of the gross specimen, consists of a homogeneous material, composed of fibres undergoing mucoid degeneration. They stain very badly, taking up a little of the eosin stain but none of the hæmatoxylin. In parts, there are a few badly-stained round cells; in others, an appearance that suggests glandular tissue. It was impossible to stain a section so as to study this tissue properly. There are in all parts of it huge blood spaces filled with blood corpuscles and fibrin. These spaces show no endothelium lining the walls, but appear to be fissures in the degenerated tissue.

The bloodvessels in the main sarcomatous portion of the tumor (Figs. 7 and 8) are not numerous. When found they invariably have well-formed walls. The endothelial lining can be seen in some specimens, but in others the walls seem to be formed by a thin layer of condensed tissue.

The exact morphological position of the tumors described in the three cases is not quite clear. That they are distinct from one another is quite certain, but whether we have any right to bring any one of them into the class of adrenal growths is open to doubt. In only one of these cases was a post-mortem obtained, and, unfortunately, nothing is said in the report concerning the presence or absence of the adrenal body on the same side. In all three cases the growth was at the lower end of the kidney, which, at least, is suggestive, even allowing that the growths arise from adrenal elements, of an origin from adrenal rests, and not from the gland proper. It will be better to discuss them separately.

Case I. belongs undoubtedly to the type previously described as an "adenoma of the kidney." The tubules are similar to convoluted tubules, and, as far as a careful examination shows, there is no tissue in the specimen that at all resembles the adrenal body.

I find in Kelly's[1] monograph two cases reported (Cases

[1] On Hypernephromas of the Kidney. Philadelphia Medical Journal, 1898.

8 and 9) that show tissue very like it. In Case 8 he reports the following: "The specimen was found post-mortem at the outer periphery of the cortex of the left kidney. It was a cyst the size of a nut, about one-third of which projected from the kidney and was firmly attached to its capsule, while the remainder was separated from the renal parenchyma by bands of connective tissue. On section the cyst was filled with brownish hemorrhagic fluid, and from its walls projected soft villous-like excrescences, from 1 to 2 mm. in length." The description of the microscopic specimen does not correspond exactly with ours, but the appearance (Fig. 8, Kelly) resembles that shown in the drawings of our case (Figs. 1 and 2). The drawing in Kelly's illustration is not at all clear, owing to the fact that it is probably a microphotograph. The diagnosis he gives his specimen is a "papillary adenoma of the kidney, associated with a small adrenal lipoma." In Case 9 he "accidentally found in the cortex of one kidney, near the surface, a pea-shaped, rather circumscribed nodule, of a yellowish-white color, and of a rather soft consistence." This proved to be very much like our own case in appearance, and was diagnosed as a "tubular adenoma." These cases may be considered as initial stages of larger growths, and it is quite possible that such a case as is depicted in Case 9 might in time become as large as ours.

Noble[1] has described a case of "hypernephroma" which showed physically the same characteristics as ours, and had remarkably similar appearances under the microscope. Clinically it differed somewhat. It occurred in a young woman, aged twenty-four years, and, unfortunately, no urinary analysis is given in the history. A diagnosis of tumor of the kidney was made, and the growth removed. The growth proper measured 9.5 cm. in length by 9.5 cm. in breadth. The substance of the tumor was grayish-yellow in color, and in places showed orange staining. It

[1] American Journal of Gynecology, No. 1, vol. i.

was opaque, finely granular, friable, and in places blood-stained. It was ramified by sinuses, most of which appeared to contain coagulated blood. In the upper portion there was a large blood cyst.

Microscopically the tumor showed a thick surrounding capsule containing bloodvessels and a few narrow tubules lined with cuboidal epithelium. The tumor substance is distinctly glandular in type. Apparently it consists of a plexus of tubular alveoli, separated by very delicate connective tissue septa, and lined by rather large cuboidal or polyhedral cells, containing uniform rounded nuclei, situated near the centres of the cells and surrounded by a broad band of protoplasm. Some of these glandular spaces are entirely filled with cells. They frequently contain collections of red blood cells in their centres. In some areas some of the tumor cells contain yellowish pigment, while others show clear vacuoles. In many places cells seem to be arranged about disintegrating thrombi. Bloodvessels with well-formed walls are rarely observed, but large numbers of the glandular acini are *tunnelled and filled by well-preserved blood cells, suggesting that there may have been some circulation in contact with the cells of the neoplasm.* (The italics are mine, and are meant to call attention to the remarkable similarity between this and our case.)

Kelynack[1] has found tissue in an adrenal body precisely similar to that described. His case is the following: "Case 1, male, aged sixty-three years, death from cerebral hemorrhage. Right adrenal much enlarged, pyramidal in shape; weight, 1½ ounces. Consisted of soft, pinkish-white vascular glandular-looking tissue.

"*Microscopically.* Abundant fibrous stroma, infiltrated in places with small deeply-staining round cells. Spaces irregular in size and shape, lined or filled with more or less cubical cells, each with a large, well-defined nucleus. Some

[1] Renal Growths, p. 164.

spaces presented slight papillomatous ingrowth. In some parts the columnar arrangement of the cells closely resembled the zona fasciculata of the normal adrenal."

The drawings are shown in Figs. 72, 73, and 74. They are models of clearness, and show a tissue that is the same as that described in our case and in Noble's, with this difference, that there are no blood cells present in the tubules, and there are in places intracystic growths. If we are to accept this case of Kelynack's as an undoubted adrenal growth, we are forced to consider that our case, and Noble's, and Kelly's belong to the same category. Nevertheless, the tissue is very unlike that found normally in the adrenal body, and further proof will be necessary before we can unhesitatingly place them in this class. As far as all the cases above quoted are concerned, with the exception of Kelynack's, it is just as logical to assume that they are derived from a renal rest as from an adrenal. They were all found in the kidney, and there is no reason why they should not have arisen from renal tissue, just as thyroid adenomata arise from thyroid tissue in the substance of the thyroid gland. Kelynack's case is the stumbling block. It was found in the adrenal body—in a body that showed no definite evidence even of an adenomatous growth, a hypertrophy of the gland—and yet it shows tissue like the convoluted tubules of the kidney. Can it be that we can find renal rests in the adrenal? This is an interesting speculation.

Case II. shows a tissue of remarkable characteristics. The arrangement of the cells into irregular-shaped alveoli, the close packing of the cells, the definiteness of the basement membrane, the clear definition of the outlines of the cells, the well-marked, large nuclei, and the coarsely granulated protoplasm together form a typical picture.

Kelynack[1] figures a specimen like this which he removed, post-mortem, from an adrenal body. As it was obtained

[1] Loc. cit.

actually from a definite adenoma of the adrenal body, it must be accepted as having great weight. It is as follows:

"Case 3.—Female, aged sixty years. Death from chronic interstitial nephritis. Left adrenal elongated, and presenting at its central part a rounded, slightly elevated mass, of the size of a small walnut; weight, half an ounce. The growth was more or less localized, but had no distinct capsule. It was yellowish-white in color, and very similar in general appearance to the normal adrenal cortex, but with areas in its midst having a more or less homogeneous appearance."

Microscopically it presented more distinctly a glandular type than even the two preceding specimens. There was a very abundant fibrous stroma, exceedingly rich in vessels distended with blood. Alveolar spaces filled with large epithelial cells of distinctly glandular type. In some places the masses of cells became elongated into columns closely resembling the normal adrenal. The cells in the more superficial parts of the growth presented distinct characters of adrenal tissue. In the deeper parts irregular areas appeared to be undergoing degenerative change, had an indistinct appearance, and failed to stain. The microscopic specimens are figured in Figs. 77, 78, and 79. Fig. 79 is an exact picture of the growth shown in our Fig. 4.

Bland Sutton[1] describes a case in his book on tumors. He calls it an adrenal sarcoma. Later on, in discussing the treatment of renal sarcomata, he says that he knows of no case of sarcoma of the kidney that survived operation more than a year except those arising from adrenal structure. It is hard to understand why he classifies a growth consisting of such evident epithelial elements among the sarcomata.

There can be no doubt that this growth is more definitely of an adrenal type than any of the others de-

[1] Tumors: Innocent and Malignant, p. 139.

scribed. It is impossible while examining this specimen to prevent oneself from comparing it in its cell grouping with the zona fasciculata of the adrenal, even in spite of the many differences between them as to the size of the cells, their staining properties, etc. The closely packed tubular or alveolar arrangement and its uniformity are totally unlike anything we meet with in the normal kidney.

Case III.—This, in its macroscopic features, answers to the description of most adrenal growths that have been removed by operation. I recognized at once, after removal, from its circumspection, color and consistence, that it was a growth like that described in Case II. It had more spots of softening than the latter, and it had burst through its capsule and infiltrated the perirenal tissue; but otherwise the growths were identical. But when it was examined microscopically it was seen to be of quite a different type. It was only after a very careful search that epithelial elements were discovered (Fig. 9). The main part of the growth is evidently a sarcoma, and the sarcomatous elements are well shown in Figs. 7 and 8. As to whether the cells shown in Fig. 6 are mesoblastic or epithelial we cannot say with certainty; those in the drawing marked "B" look decidedly like epithelial cells. Fig. 9 deserves careful consideration. The arrangement of the alveoli-like groups is sufficiently suggestive of glandular tissue.

Kelly figures a specimen (Case VI., p. 26) that resembles in its microscopic appearances some parts of our case. I quote his case rather fully, as it shows great similarity in gross appearances, but great differences in microscopic: "Male, aged fifty years. Found in the left renal region a tumor about the shape of the kidney, and of the size of a large ostrich egg, pushing forward the abdominal wall. It has an uneven, nodular surface, and is completely surrounded by a capsule. On section no kidney is discernible. The entire growth is composed of areas the size of apples and smaller, without sharp demarcation. Some of

these are of whitish color and soft consistence, without distinct juice; other larger areas are yellowish and dry; still others possess a honeycomb-like structure, in that between whitish bands there are visible spaces the size of peas or smaller, filled with yellowish, yellowish-red, or blackish masses.

"*Microscopically* the tumor was made up of nodules of varying size, the majority of which are surrounded by distinct and often rather thick bands of connective tissue. From this internodular connective tissue there proceed, here and there, very fine septa of similar connective tissue interstices of the nodules. In well-preserved and apparently young areas the tumor is made up of young cells and a stroma, the latter being composed of relatively large capillaries, which possess an apparently intact endothelium. In older areas the stroma consists of very large capillaries, which are much distended with blood, and whose endothelium does not appear intact everywhere. The capillaries form a rather close network, whose interspaces contain the tumor cells, which rest directly on the endothelium of the capillaries. On horizontal section they appear attached to the vessel as radii; in places where the vessel is cut longitudinally the distal poles of a row of cells are almost in contact with the corresponding poles of a row of cells opposite to them and attached to an adjoining capillary. Thus there result tubule-like formations, possessed of a lumen, which is seldom entirely empty, but is generally filled with desquamated cells and detritus. In older areas the spaces between the rows of cells are often very large and entirely filled with necrotic cells. The well-preserved cells are high-cylindric in shape; in part very much elongated and club-shaped; others, however, are irregular and polygonal. In certain sections the cell protoplasm contains in addition to fine vacuoles also a considerable quantity of large vacuoles which are to be viewed as residua of extracted fat. The cells have one—rarely two or more—very large round nuclei, which are generally sit-

uated toward the free extremity of the cell, stain intensely, and contain a large nucleolus each. A few karyokinetic figures are to be seen. There are areas of necrosis of various size distributed throughout the tumor, and here and there large and small hemorrhages are to be detected. At the periphery of certain nodules, but never within the cells, rusty brown pigment yielding the iron reaction is found. In certain portions of the tumor the tumor-cells can be distinctly observed penetrating the walls of the veins and giving rise to the complete occlusion of the lumen of many of the vessels. The glycogen test is positive."

Résumé. Large malignant tumor of the left kidney, unaccompanied by alteration of the left adrenal body, the tumor cells are high-cylindric, contain fat vacuoles, and are intimately associated with the bloodvessel system; the tumor invades the bloodvessels and exhibits a great tendency to generate and to give rise to hemorrhages (Case 6, p. 26). The microscopic specimen (Fig. 6) shows the appearance very clearly, and the cells that line the walls of the capillaries, remind one of those described by me in Fig. 6, B. The alveolar nature of the specimen resembles that of almost all the tumors described.

It will be seen from the foregoing remarks that the variety, even in well-authenticated tumors of the adrenal body, is very great. The most remarkable variety is shown in the series of cases described by Kelynack, where, of three cases of growths found in the adrenal body, in each one the microscopic appearance differed. It should be said that, from the description, in only one of the three cases does it seem that the gross appearances show a definite adenoma.

I have not attempted to place my cases in the class of adrenal growths, but have rather indicated the points which favor such a conclusion and those that oppose it. Much more work needs to be done along this line before we can accept the majority of cases reported as belonging

to the adrenal tissue. There is no doubt that the views of Grawitz opened up so fascinating a vista that many men who have described tumors of this nature have been influenced by desire rather than facts; and so we have a mass of useless matter to consider that cannot be accepted as evidence.

It is very probable that many of the peculiar growths met with in the kidney arise from aberrant tubules of the pro-, meso-, and metanephros. I have purposely avoided entangling myself with the controversy that has been waged on this question by many authorities, such as Grawitz, Lubarsch, Hildebrand, Hansemann, Horn, Sudeck, etc. The subject is too vast for a paper like this. I would recommend highly the monograph of Kelly to those who are interested in this subject.

WHAT IS THE LIMIT OF SAFETY WHERE MORE THAN ONE OPERATION IS INDICATED?

By Albert Vander Veer, M.D.,
Albany, N. Y.

This is surely a subject that presents itself with much force to the operating surgeon. In time of battle, when the case of the wounded soldier presents, with the right arm shot away by a portion of shell, when the left hand is in a somewhat similar condition, and with a Minie ball through the left lung, what can be done must be done at once and accomplished cautiously. Bleeding vessels must be controlled with great care; mangled portions of tissue and extruding portions of bone must be properly treated, and the wound of the chest properly looked after. To be sure the chances of recovery in such a case are exceedingly doubtful, but a certain amount of surgical work must be done, although it taxes the remaining strength of the patient. In like manner when the brave fellow has lost an arm, also a leg, but other portions of the body being in a normal condition, an earnest effort is indicated to save the soldier's life. Such cases have been known to make a good recovery.

Cases of railroad accident that result in the loss of both lower extremities not infrequently make good recoveries, but I am of the impression that this does not apply so thoroughly to the loss of both arms. I believe this may be looked upon as worthy our respect, and that we cannot deny that the nearer we approach the heart and brain the more serious are our cases likely to be, and the

greater the mortality list. It is true that, at times, portions of the thorax may be seriously damaged, and yet under aseptic treatment marvellous results follow. In realizing such conditions, and bringing to our aid modern improved methods, we can attack such dangerous cases almost anywhere for relief, restoration from surgical shock being a factor to be respected, and to be made use of with the greatest energy. But there are cases that present to us in which we have as the surgical symptoms the following, as, for instance, in making an amputation of the limb the point of election, the point of operation, the place of amputation that will give the patient the best result in the wearing of an artificial limb, and who may also have present one or more herniæ or tumors requiring operation.

Again, I have often observed that we have this question presented to us in cases that require more than one particular operation; for instance, the woman who presents with a very encouraging case of carcinoma of the breast, in which you feel you may do a very complete and satisfactory dissection of the lymphatic glands, supra- and infraclavicular, axillary, and otherwise, removing all the pectoralis major and minor muscles with every prospect of her making a good recovery—if at the end of this somewhat long operation you stop and do nothing more ; but, supposing this same patient has also an enlarged thyroid, cystic in character, growing somewhat rapidly, possibly, when considering the condition of the breast, there may be a tendency to malignancy, will you also operate upon this at the same time or will you do this operation first and then operate upon the breast later ? These are problems not always easy to solve. If you do both operations at the same time, do you not diminish very materially the chances of this patient's recovery from the acute surgical intervention ?

Take the case of another patient who comes with multiple fibroids of the uterus : There is evidence of pressure upon the ureter on one side, there are signs of

pyelitis on that side ; the left kidney is sensitive to the touch ; the fibroid is large ; it is believed that the kidney is somewhat enlarged ; obstruction of the rectum also presents as a result of that portion of the fibroid being impacted in the pelvis. The patient has a lacerated cervix, not serious; and while there is no evidence of malignancy, yet the fibroid is growing. She has also a well-defined cystic tumor in the left breast, possibly not malignant ; no axillary involvement whatever, but following out the thorough operation done upon the breast it will be necessary to remove all the lymphatic glands. Let us consider now what is the best course to pursue in this case. The patient is more concerned about the tumor of the breast than about the abdominal growth. The surgeon is more concerned about the damage being done to the left kidney than the fear of malignancy connected with tumor of the breast. In view of the laceration of the cervix, will it be desirable to do a complete panhysterectomy, an operation that requires somewhat more time, even in the hands of the ablest operator. Will he do a supravaginal hysterectomy, leaving the cervix to after-treatment, if necessary; or will he do either of these operations and also the one upon the breast at the same time ?

A personal experience with a case somewhat similar, when at the earnest request of the patient a double operation was done, removing the tumor supravaginally, and the breast and lymphatic glands at the same time, but the tax made upon the patient was so great that while she made a good recovery, still an impression was left that she was an exceptionally sanguine and rebounding subject for convalescence.

While cases do not present very frequently, yet I have sometimes been very reluctant to remove both breasts when implicated in a condition of carcinoma. Conditions may group themselves in such a way that a multiple operation may be done without any apparent taxing of the patient's strength and vitality, but if the lesions are

distributed to many distant portions of the body it is not so likely.

One can remove a uterine fibroid, operate for the relief of an umbilical hernia, and empty the gall-bladder of a quantity of gallstones, and perhaps not tax the strength of his patient too much.

While it is not common, yet these are continued operations in a territory that you have already invaded, and, possibly, the individual can readily stand the additional demand made upon their strength.

I have sometimes felt that we were taxing our patient a good deal in doing a double herniotomy and also an operation for removal of the breast at the same time, yet patients will recover from such a procedure. The injury to certain nerve tissues, when doing what we may call a combined operation, must not be lost sight of. Operations that approach the stomach, operations that involve small nerve centres, are of that class greatly to be respected when we consider the recovery of our patient and a low mortality list.

The male patient does not bear exceedingly well a continued operation that involves the organs of generation. To a certain extent this holds true regarding the female, but how often are we astonished by our ablest men and best operators who begin by dilating the cervical and uterine canal, curette thoroughly, then repair a bilateral laceration, pack the uterus with gauze, then commence their operation for the relief of a cystocele, followed by relief of a rectocele and lacerated perineum! One feels that this patient has been called upon to endure about as much as the ordinary system would be expected to tolerate, and now for a moment we are startled by the news that the abdominal cavity is to be opened, a right ovary removed, if the appendix is found diseased that also to be removed, and then a ventral fixation of the fundus of the uterus. If the records were really known as to the results of such successful operations it would be of great importance to

the profession to know the real mortality that is brought about by so extensive and continuous operations. This I look upon as the most heroic of all surgery.

Just where would we divide the procedure for relieving a patient suffering from such a number of surgical complications? Would it not be better to simply relieve the endometritis, repair the lacerated cervix, then enter the abdominal cavity, do what is necessary there, and stop, waiting for the patient to recover her full strength before attending to the cystocele, rectocele, and lacerated perineum? Not infrequently these patients have, in addition, some rectal complication, fissures, hemorrhoids, rectal polypi, or some such lesion that needs attention. Just where will we make the division before we begin operating? A patient not infrequently may suffer from such a complication, and is there no settled, fixed surgical law for our conduct in such a case? Text-books are not altogether clear upon the subject, some much better than others. It may be said that every surgeon is a law unto himself, as to the success of his practice, and when doing multiple operations. One surgeon is much more dexterous than another, and his operations are not so exhausting to the patient. Then, again, he may have a method of operating in such a manner that it is no great tax upon his patient. Such experiences should be presented to the profession that younger men may profit thereby. Take, for instance, a case in which it becomes necessary to remove one kidney. Will we also in this case operate for umbilical hernia that is presenting very seriously? Perhaps strangulation may demand such a procedure. Will this lessen our patient's chances of recovery, who may perhaps demand all the necessary surgical intervention when under the ether? I would say in such a case operate only when the hernia is in danger of strangulation. I am led to say that when operating in cases of strangulated hernia, do that and nothing more, the exceptions being exceedingly few. This form of surgical lesion, as we all know, exhausts the

nervous force of the patient very profoundly; therefore, we should be very cautious in adding to it. The same remarks hold good in operations on the stomach. As we have all observed, the mere handling or prolonged examination of the latter organ often causes severe shock. In the operation of nephrectomy I do not like to do more than that one operation upon any one patient at any one time. This I think also holds good in operating upon the lung or opening the pleural cavity. Operation upon the brain is quite enough at any one time.

In fact, in this very brief paper, I am desirous of stating that I believe multiple operations, deliberately planned, should not be encouraged, although our surgical technique of to-day allows us to do more than was ever dreamed of in the near past.

SURGICAL *VERSUS* MEDICAL TREATMENT OF CHOLELITHIASIS.

By John B. Deaver, M.D.,
Philadelphia, Pa.

"It is in the nature of things that when a part of the human body has been made more accessible to the eye and hand by the progress of our science the treatment of affections of that part should change from the medical to the surgical, or at any rate from the general to the topical side."

This philosophical sentence is quoted from an English work by Sir Felix Simon, and exactly states the trend of modern medical teaching in lithiasis of the gall-bladder. The surgery of the gall-bladder and the bile ducts is being elaborated and perfected year by year, and Marion Sims' suggestion that gallstones come within the sphere of the surgeon has been verified beyond expectation by the labors of Mayo Robson, Hans Kehr, Richardson, Murphy, Fenger and many others. With modern aseptic technique, laparotomy has been robbed of its perils and to-day we find many sufferers relieved of the intense agony of gallstone attacks by an operation opportunely performed.

In discussing methods of treatment it is well to have some idea of the etiology of gallstones and their methods of formation. As yet this phase of the disease is open to much doubt and is a fertile field for investigation. It has long been recognized that the precipitation of bile products upon a nucleus was the starting point in the disease, and this nucleus was supposed to be mucus, epithelium, or some other detritus caused by a stagnation of the bile.

Since 1890 the infectious nature of cholelithiasis has received much attention, and during 1897 gallstones were experimentally produced by Mignot, Gilbert, and Fournier, by inoculation with the bacilli coli and the bacillus of typhoid fever in attenuated culture.

With the experimental production of gallstones by bacteria and with the frequent finding of micro-organisms, either living or dead, within the calculi, the view is gaining ground that "a lithogenous catarrh induced by micro-organisms is the most important single factor of gallstone formations." (Osler.)

Cholesterin is the chief constituent of gallstones and is formed in the gall-bladder or bile ducts. It is held in solution by the bile salts and under certain conditions precipitates and forming around a foreign body, a micro-organism, etc., rapidly forms a gallstone in five or six months' time. It is a clinical fact that stones in the gall-bladder are usually of about the same age and chemical composition pointing to some distinct past disturbance in the gall-bladder.

Bearing these few etiological facts in mind and remembering the influence which age, sex, sedentary occupations, and overindulgence in food have upon the disease, we should be more constantly on our guard to diagnose the condition in its early stages and before the numerous attacks have caused extensive adhesions about the gall-bladder. These adhesions occurring most frequently between the gall-bladder and the pylorus, intestines, or omentum, especially the duodenum and colon, give rise to various symptoms which complicate the case and cloud the diagnosis.

The treatment of gallstones at the present time is being largely discussed by both the internists and the surgeons with much the same arguments as were advanced a few years ago in appendicial disease. At the present time no physician of intelligence fails to call a surgeon into consultation when he diagnoses a case of acute appendicitis and the promptness with which operation is advised is recog-

nized as determining the mortality of the disease. If this is delayed the disastrous sequelæ of gangrene and perforation of the appendix, with a resulting peritonitis, occur in the large majority of instances.

In gallstone disease the same argument holds good. An operation performed while the stones are still in the gall-bladder produces a mortality which is nearly nil, but if gangrene of the gall-bladder takes place, or if the stones become impacted in the common duct, the mortality rises higher and higher even to twenty-five per cent.

The results of impaction in the common duct are frequently disastrous to the integrity of the biliary passages. Infection of the bile ducts, cholemia, pancreatitis, rupture of the duct with fistulæ formation or a general peritonitis may occur. An ulcerative communication between the gall-bladder and a neighboring viscus, particularly the stomach, may take place. If the patient survives the attack extensive adhesions to the duodenum, stomach, colon, or omentum may make life miserable. The contraction of the adhesions may cause obstruction of the bowel at any time, and the constant irritation of the stones may give rise to a carcinoma of the gall-bladder.

These complications are not met with in isolated instances, but are frequently seen by the surgeon at the operating table, and many cases are lost, for which the operation is held to account, which are really due to the procrastination of the attending physician. It has been urged in favor of medical treatment in the early stages of gallstone disease that post-mortem records have frequently shown the presence of stones where the clinical history has not given evidence of the fact, and that proper medical treatment should keep the stones at rest and prevent inflammation, thereby avoiding surgical interference.

If a drug could be found which would have a solvent action upon gallstones, then the surgery of cholelithiasis would sink into oblivion. Since the time when the famous Durande mixture of ether and turpentine was so widely

exploited up to the present, various remedies have been suggested which had a solvent action on gallstones. The so-called saline cholagogues, the salicylate sulphate, benzoate, phosphate, bicarbonate, and chloride of soda, sulphate of potash and ammonium chloride have all been advocated by various authorities.

Olive oil is held in high repute to the present day as an aid to the passage of gallstones, and while in the test tube it does cause a loss of weight in the gallstones, yet there is not the slightest evidence that the oil can reach the cystic duct or the gall-bladder. The oil is said to have an action upon the mucous membrane favoring an increased secretion; but if we accept the view that the expulsion of the stone is due to the efforts of the diseased bile passage to get rid of an offending body, wherein does this efficacy lie?

Mayo Robson states that after an extensive use of olive oil he has never seen much good result from its employment. This is quite in accord with the writer's experience.

The pilgrimage to Carlsbad has been made by many sufferers from gallstone disease in England and on the Continent, and by those few from this country whose means permit such an expensive course of treatment. It is undoubtedly true that many sufferers from gallstone colic have been relieved by the Carlsbad waters. The regular mode of living, the soothing effects of the warm medicated waters on inflammatory lesions, the laxative action of the springs, and the beautiful surroundings are all conducive to powerful stimulation of the tissues. As Kehr puts it, "The principal material at Carlsbad is the gall-bladder lithiasis of the prosperous class and not the chronic obstruction of the bile ducts." The catarrhal inflammation is allayed and the bile once more flows unimpeded in and out of the gall-bladder. The symptoms have abated, but the disease itself is untouched, the stones remain, and like the appendix, when inflammation has once found a favorable soil, it is very apt to recur again.

If the disease passes into the stage of latency, no further trouble resulting, the patient is considered as cured and a triumph recorded for Carlsbad.

Gallstone colic often occurs again and again until the frenzied sufferer, obtaining relief at first in a single dose of morphine, becomes more and more habituated to its use and soon finds that the hypodermic syringe has become indispensable. This is too often the usual result of medical treatment of gallstones.

There are many medical men in this country who will oppose early operative interference in cholelithiasis for some years to come, but just as in appendicitis, the evidence of those whose ante-mortem pathological experience is greatest, will weigh in the balance and decide the future treatment of the disease. Despite the work of Mayo Robson in England a recent publication upon gallstone disease by J. H. Keay, has appeared under the title of *Medical Treatment of Gallstones.* The title, however, is a misnomer, as nothing new or startling is advanced from the medical standpoint, while the ulterior purpose of the book is an attack upon the surgical treatment of cholelithiasis. A review of the author's position would subserve no useful purpose as the arguments advanced against operation are deduced from an experience of three cases, one of them himself and another a relative, and from a perverted view of the statistics of the Registrar-General.

Some of his statements will serve to show what harm such teachings may have upon many practitioners. He admits that the diagnosis of gallstones in their earlier stages should not be difficult, and yet denies the certainty of diagnosing empyema of the gall-bladder and suggesting that the forces of nature are more potent in relieving this suppurative process than a cholecystotomy with drainage. He calmly suggests "that it is always possible that the stone may perforate the duct and pass quite safely into the intestines." No thought is apparently given to the dangers of peritonitis from this same perforation. Of chronic duct obstructions

he says "that a time will come when, after the complete blockage of the common duct by a stone, life is in serious danger." Of course it is, but should never be placed in such jeopardy by prolonged and useless medication with antiquated cholagogues.

These few abstracts will serve to show the uselessness of the book as an exponent of the modern teaching of the treatment of cholelithiasis.

The surgical treatment of gallstones will depend upon the situation of the stones, and the presence of such complications as adhesions or biliary infection. When in the gall-bladder if there be but little evidence of disease of the walls indicating a mild infection, cholecystotomy may be performed with careful Lembert suturing of the opening through which the stones were extracted. If suppurative cholecystitis exists a cholecystotomy with drainage is required. Stones in the cystic duct require a cysticotomy and chronic obstruction of the common ducts necessitate opening the duct. Calculi become lodged in the common duct according to Courvoisier in 4 per cent. of cases, according to Robson in 13.25 per cent. When the obstruction is acute in character with intense jaundice, vomiting, chills and fever, and violent colic, operation is contraindicated. Sufficient morphine can be given to quiet the intense pain, hot applications applied over the gall-bladder, and castor oil given to keep the bowels moving. If the inflammatory condition subsides the stone may pass onward into the duodenum, but if the attacks persist for any length of time, with fever and rapid pulse and symptoms of cholangitis, then choledochotomy should be performed with drainage of the hepatic ducts. Should the condition of the patient be so poor that a prolonged operation would cause death, we may perform a cholecystostomy, and later when the patient is in better condition remove the stone from the duct.

Frequently occurring attacks of infectious cholecystitis will give rise to more or less extensive adhesions, which not

only give symptoms *per se*, but complicate operation. The presence of an adhesive pericholecystitis can often be diagnosed, and is a further argument for operative interference. In addition to the adhesions the gall-bladder becomes thickened and shrunken in consequence of frequent inflammatory attacks and can never be palpated. If the adhesions are not too extensive such a gall-bladder may be excised, but there is so often such marked adhesion of the structures around the gall-bladder that its removal is very difficult and necessitates extensive gauze drainage. An attempt to dissect it loose from the liver is followed by considerable oozing and necessitates extensive gauze drainage. The writer is usually satisfied with breaking up the adhesions about the pylorus, duodenum, and colon, covering the raw surfaces with "cargile." The gall-bladder is then opened, the calculi removed and a rubber drainage tube protected by a gauze strip introduced into the gall-bladder. Hydrops of the gall-bladder usually requires a cholecystectomy unless the organ is in good condition, when incision and drainage will give good results. If the hydrops is due to an infection of the gall-bladder and not to calculous obstruction of the cystic duct, medical treatment should be tried, for a time at least.

Non-calculous infectious cholecystitis should be treated medically so long as the condition shows any tendency to improvement, but in the event of increase in the severity of the symptoms, in spite of the best-known medical means, hepatic drainage should certainly be carefully considered. These cases are those most likely to be benefited by the Carlsbad treatment. The question of the diagnosis between non-calculous and calculous cholecystitis is most important, and too much stress cannot be laid on a careful history of the case, and especially of the previous history, indeed this applies to every phase of cholelithiasis. Cholecystitis occurring in a patient who does not give the history of a previous biliary colic or arising during or after an infectious disease is in favor of uncomplicated or non-calculous

cholecystitis. Carcinoma of the biliary apparatus comes properly under the care of the medical man.

In operating upon gallstone subjects calcium chloride should be administered for a few days previous to operation, giving ten or twenty grains three times a day. It seems to lower the time required for the blood to coagulate and thus lessen the risk of postoperative bleeding. The presence of the bile products in the blood has some action, as yet imperfectly understood, which greatly retards coagulation. The writer has lost cases from severe capillary oozing following an otherwise successful operation.

The placing of a sand pillow beneath the back will so arch the liver forward that when the abdomen is opened the liver may easily be drawn out of the abdomen sufficiently far to obtain a better exposure of the biliary passages. Adhesions should be carefully separated and unnecessary handling of the liver, gall-bladder, or ducts avoided.

Cholecystostomy. The gall-bladder is exposed by an incision through the right rectus muscle, and excepting in highly infectious cases, is generally freed from adhesions, which when met with usually involve the abdominal wall, omentum, duodenum, and pylorus. The gall-bladder is isolated by gauze pads and aspirated of its contents. The puncture is then enlarged and the gall-bladder examined for stones; if present they may be removed with forceps or scoop. A small piece of iodoform gauze is introduced into the gall-bladder, and the opening temporarily closed with an hemostatic forceps. The gall-bladder is then brought into the wound if possible. A piece of gauze is passed around the gall-bladder in such a manner as to allow the lower end of the gauze to protrude from the lower end of the wound and the gall-bladder is sutured to the aponeurotic layer of the abdominal wall. Before tying the gall-bladder sutures the gauze pads are removed, but not the gauze around the gall-bladder. The sutures are tied, the wound above and below the gall-bladder closed, the hemostatic forceps removed, the piece of iodoform gauze taken

out of the gall-bladder, and a solid rubber drainage tube carried into the gall-bladder. This drains into a receptacle at the side of the patient.

When acute empyema exists it is safer in most cases to merely suture and drain the gall-bladder, not searching for calculi until the danger of infecting the ducts has disappeared. When it is impossible to bring the gall-bladder into a position favorable for its suture to the peritoneum, it must be protected by gauze packing after introducing the drainage tube. Acute infectious gall-bladders should be palpated as little as is consistent with good work, and in these cases the common duct should not as a rule be probed for the presence of a stone.

The so-called "ideal" cholecystotomy, where the opening in the gall-bladder is sutured after removing the stone or stones, is an unsafe procedure unless the case be free from infection and the suturing very carefully performed, and, bearing in mind the fact mentioned early in this paper that calculi in most instances are due to bacterial infection, these cases are necessarily few. Homans has reported a case where gallstones formed around silk sutures twenty months after recovery from cholecystotomy.

Choledochotomy is performed by incising the duct over the stone, removing it and searching with the finger and probe to ascertain that the ducts are clear; this is particularly important. The main as well as the right and left hepatic ducts are to be explored. The wound in the common duct may be closed with Lembert sutures if the integrity of the duct will permit and always drained with a gauze strip. If the position of the duct renders suture impossible, or if its coats are infiltrated and friable, a rubber drainage tube should be introduced well into the hepatic duct and carefully surrounded by gauze packing. In certain cases of choledochotomy it is wise to drain the gall-bladder as well.

When calculi are situated close to the duodenum in the ampulla of Vater the duodenum must be opened in its

anterior wall and the duct laid open from within the duodenum. If no intestinal contents have escaped, a Lembert suture of the duodenum is sufficient, without drainage.

When the common duct immediately to the proximal side of the ampulla of Vater is the site of a stone which cannot be dislodged, the duct may be exposed by reflecting the posterior parietal peritoneum to the outer side of the descending duodenum.

Choledochenterostomy is rarely performed. The writer has never had a case requiring this operation.

Cholecystenterostomy is an operation which should be confined to those cases of obstruction of the common duct due to a malignant growth. This operation was formerly performed in chronic pancreatitis, but has lately been abonded for cholecystotomy, with drainage.

Postoperative vomiting is frequent in gall-bladder surgery and is often difficult to control. Lavage and the administration of all nourishment by the rectum are the best agents for its control.

Should capillary oozing follow operations on markedly jaundiced patients all treatment usually fails and the patient becomes ensanguinated, and death results. Calcium chloride may be administered by the rectum, twenty grains every four hours, and full doses of opium given.

The recurrence of pain after a successful operation is not due to the recurrence of stones, in the majority of instances, but to the presence of adhesions. The latter being ameliorable to operative interference with less risk than that attending the primary operative procedure. The early establishment of peristalsis may prevent the formation of adhesions.

Biliary fistulæ following cholecystostomy persist for a few months as a rule, but ultimately close. Continued persistence of the fistula is due to some obstruction of the common duct. In some cases cholecystenterostomy is the best operative procedure.

Mucous fistulæ may also result from the same operation and are due to an obstruction of the cystic duct. Sometimes a mucous fistula follows a cholecystectomy and is due to continued secretion from "islands" of mucous membrane not destroyed by the operation.

REPORT OF A CASE OF URETERO-URETERAL ANASTOMOSIS.

By George Ben Johnston, M.D.,
Richmond, Va.

The unintentional division of the ureter during operation in the abdominal and pelvic cavities is not of frequent occurrence. Nevertheless, this accident is liable to occur in cases where numerous adhesions exist and the anatomical relations are much disturbed. The ureter may be so far displaced from its normal position and so completely embedded in a mass of adhesions as to make its identification practically an impossibility. In the event of such an accident a decision as to the best procedure to follow is of paramount importance. Several methods of dealing with the condition are at hand.

1. The kidney on the injured side may be removed.
2. The ureter may be passed into the small intestine, colon, or rectum, into the vagina, or through the abdominal wall.
3. The kidney may be brought down and the extremity of the ureter sutured into the wall of the bladder.
4. An anastomosis may be made between the extremities and the divided ureter.

This classification, while not exhaustive, covers the most important procedures so far devised. Of these methods the two last are most worthy of consideration. Uretero-ureteral anastomosis would seem to be the operation of choice.

Uretero-ureteral anastomosis, or uretero-ureterostomy, as the operation is designated by Kelly, may be performed

in various ways. Henry Morris gives the following classification:

1. End-to-end anastomosis by suturing the ends together in a transverse line.
2. The end-in-end anastomosis.
3. Lateral implantation.
4. End-to-end anastomosis by suturing the ends together in an oblique line.

The transverse end-to-end method was used by Schopf (1886) in the first recorded case of uretero-ureteral anastomosis. The objections to the operation are so serious that it is practically never performed to-day. Poggi originated the end-to-end anastomosis. Lateral implantation was devised and described by Van Hook, in 1893. Kelly was the first to apply this method to the human subject. The oblique end-to-end anastomosis was first used by Bovée.

To the cases of uretero-ureteral anastomosis already reported we are able to add another. This case presents points of sufficient interest to merit description. As will be seen later, a modified Van Hook method was used in making the anastomosis.

Case of Ada C., aged forty-one years, negress, married, housewife, American by birth.

Family History. Negative.

Previous History. Healthy child. Menstruated at fifteen years. Had pertussis and malaria at sixteen years. Married at seventeen years; had five children, of whom three are living and in good health. Last confinement sixteen years ago, at which time she gave birth to twins, both now dead. Since the birth of the twins has suffered with dysmenorrhœa and menorrhagia and with leucorrhœa at times, also with pain in the back and limbs, especially after exertion. She has been subject to sick headache and has had "chills and fever" occasionally. With the above exceptions her health has been uniformly good.

Present Illness. About six years ago the patient noticed on the left side of the abdomen a mass about the size of

her fist. For three years the mass grew rather slowly, reaching at the end of that time a size sufficient to distend perceptibly the whole abdomen. During the next three years the growth was much more rapid. At the time when the tumor was first noticed the patient began to experience severe pain at the menstrual periods. The pain was felt for a week before the flow began and continued throughout the period. The flow lasted for a week or ten days and was profuse. For three years this condition obtained. Thereafter the pain and menorrhagia continued, but with moderated severity. For the past five months there has been considerable flow between the periods. During this time she has suffered from poor appetite, flatulent dyspepsia, coated tongue, constipation, frequent and painful urination. There has been considerable loss of flesh and strength during the past summer.

Patient was admitted to Old Dominion Hospital, September 13, 1902, referred by Dr. J. D. Turner, of Lanexa, Va. Examination showed large tumor springing from the pelvis and filling two-thirds of the abdominal cavity. The tumor was generally adherent. Diagnosis: intraligamentous fibromyoma of the uterus with adhesions.

Operation, October 1, 1902. Anæsthesia was chloroform; later in the operation ether was substituted. A median incision was made extending from a point midway between the umbilicus and ensiform cartilage down to within a short distance of the symphysis pubis. The large tumor bulged out through the opening. Examination showed that it was an intraligamentous fibromyoma of the uterus with extensive adhesions to neighboring structures. The anterior abdominal wall, omentum, intestines, broad ligament, and bladder were all involved in the adhesions. The bladder was spread out over the front of the tumor and adherent. Numerous very large dilated and tortuous veins could be seen. The anatomical relations were much distorted. As far as possible, the adhesions were broken up by blunt dissection. Masses of adhesions including vessels were ligated

with heavy silk and cut away; about twenty-five such ligatures were required. After the tumor had been freed, a panhysterectomy was performed. The appendix was found to be in a condition of chronic inflammation and was removed. After delivery of the tumor it was found that the left ureter, embedded in a mass of adhesions, had been ligated and divided transversely about two inches above its entrance into the bladder. A uretero-ureteral anastomosis was then made in a manner presently to be described. The walls of the vagina were stitched together, leaving a sufficient opening for drainage, and a gauze drain was passed from above down through this opening. The edges of the vaginal wound were covered with gauze, since the peritoneum could not be stitched over the raw surface. The toilet of the peritoneum was completed and the abdominal incision closed by interrupted sutures. Time of operation, one hour and a half.

Method of Making Uretero-ureteral Anastomosis. A longitudinal incision one-quarter inch long was made anteriorly in the distal portion of the ureter, three-eighths of an inch below the free extremity. A small cambric sewing needle, threaded with fine silk, was passed through the anterior aspect of the proximal portion of the ureter one-eighth of an inch from the extremity. The needle was then carried through the slit in the distal portion, down the ureter one-half inch and out through the posterior wall of the ureter. The other end of the silk was threaded and the needle passed in a similar manner. The proximal portion was drawn through the slit down into the distal portion and held in place by this traction suture. The edges of the slit were united to the wall of the invaginated proximal portion by interrupted sutures of fine silk; these sutures were passed through the fibrous and muscular coats of the ureter. A probe passed through the unclosed end of the distal portion showed that the lumen was patent. Through the distal extremity a purse-string suture of fine silk was passed and the end closed off. The traction suture was

then removed and the point of anastomosis covered by a strip of gauze, the end of which was passed into the vagina.

Subsequent History. The patient left the operating table much weakened and for twenty-four hours was in a critical condition. She was supported by stimulants and infusions of normal saline. Her bowels were kept closed for three days. Thirty-six hours after operation she developed a well-marked bronchopneumonia, from which she recovered after seven days.

The morning after operation eight ounces of urine were obtained by catheterization of the bladder; thereafter she voided her urine without difficulty and passed daily about a normal quantity. On the day following operation twenty-nine ounces of urine were passed, and on the next day twenty-six ounces. Frequent examinations of the urine were made. These examinations showed the presence of a trace of albumin and considerable pus. Urinalysis of a catheterized specimen, made October 14th, showed the following: specific gravity, 1018; reaction, acid; color, amber and turbid; albumin, none; sugar, none; microscopical, a few epithelial cells, pus, neutral calcium phosphate, and amorphous urates.

Another examination of a catheterized specimen, made on October 25th, was reported as follows: specific gravity, 1008; reaction, acid; color, light amber, slightly turbid; albumin, none; sugar, none; amount, twenty-eight and one-half ounces; microscopical, small amount of sediment, epithelium, pus, and amorphous urates

On October 26th she passed in twenty-four hours, twenty-eight and one-half ounces of urine. The patient made a perfect recovery and was dismissed from the hospital on October 29th, the urinary tracts functionating perfectly.

UNILATERAL DISEASE OF THE KIDNEY SIMULATING STONE.

By Joseph Ransohoff, M.D.,
Cincinnati, Ohio.

When one considers the achievements in any field of surgery there is always one spot brighter than the rest by reason of especially good results, results obtained through faultless interpretation of symptoms and clinched by brilliant operation. In the field of renal surgery this applies to the operation for stone in the kidney, that is, when a stone is found. Unfortunately, the elating thrill the surgeon expects to experience when the finger touches the stone in the opened kidney is not always felt; in its place is chagrin, if not discomfiture, when the fullest search fails to reveal the object sought for. To whom has it not occurred? A year ago the writer saw one of the foremost specialists in kidney surgery fail to find a stone in two cases within ten days. Were Tiffany to rewrite a paper presented before the American Surgical Association in 1889 he might readily present the reports of 200 cases instead of 21 in which the kidney was explored with results negative as to finding of a stone.

Two questions necessarily co-related at once arise, the solution of which would remove the obloquy attending a seemingly fruitless if not hazardous operation. They are: 1. Have we any positive and absolute method of recognizing stone in the kidney? and 2, are there not other pathological conditions in the kidney, the symptom-complex of which cover to a nicety that of stone? In determining the question in a positive sense the Roentgen ray was of necessity a

formidable factor from the moment its penetrating power was known. With increasing experience in the methods of exposure, radiography will in most instances give positive results. There are few of the world's famous specialists who, like Leonard, are ready to make a negative diagnosis of kidney stone.

When I contemplate a few of the stones I have removed by operation, weighing 11, 15, and 20 grains, respectively, some of them not larger than a pea, and removed from very fleshy individuals, I cannot help but believe that their discovery by the X-ray would have been largely a matter of chance. It goes almost without saying that an effort should be made to locate a stone by radiography in every suspicious case before operation. The sounding for kidney stone with a wax-covered ureteral bougie, as suggested by Kelly, seems to me chimerical in the extreme. To one conversant with the variations in position of a kidney stone it must be evident that its detection by sounding must be altogether fortuitous. Aside, then, from the positive presentment of a calculus by radiography, the signs most relied upon are pain, paroxysmal or continuous, and certain changes in the urine.

To consider the former at length is beyond the scope of this paper. Suffice it to say that the pain of stone may be simulated by any gross pathological conditions of the kidney or ureter, such as tuberculosis, tumor, hydronephrosis, etc., and, what is most relevant to the question propounded, by microscopic changes in the kidney, changes affecting either the secreting, the circulatory, or supporting framework and capsule of the gland. While, ordinarily, renal colic is associated with intrarenal retention from obstructed outflow, in certain chronic affections of the kidney with acute exacerbations, the distention of a resisting capsule from within may be, and often does give rise to, a typical renal colic.

The most important factors making for a diagnosis of stone are obtained from an examination of the urine.

Everyone associates hæmaturia with stone in the kidney. While this may be as profuse as in malignant tumors, it has, in my experience of nearly twenty cases, been marked rather by sparseness. In a paper read before the American Medical Association in 1894 I insisted on the microscopic character and constancy of the hæmaturia as almost characteristic of stone in the kidney. The centrifuge alone will help us to distinguish a few, probably faded, disks in nearly every sample of urine voided, and as long as pyelitis is absent a number of leucocytes proportioned to the disks, as in normal blood. Albumin, except in traces, and casts, epithelial or blood, are not found ordinarily in the urine from a stone kidney, unless secondary nephritis has developed. The bleeding comes from the pelvis or its larger tributaries. During or after renal colic the hæmaturia may be quite profuse. Its source is then not the pelvis alone, but the congested renal parenchyma, as it is in the hæmaturia from hydronephrotic kidneys.

In the urine of 1997 persons examined by Musser blood was found by microscope in 364. All the cases of kidney stone had hæmaturia. "It is not an intermittent phenomenon, but one that is constantly persistent."

When we next consider that in certain but few cases of undoubted chronic nephritis albumin and casts are absent often for months at a time, and sometimes altogether, and that both pain and hæmaturia, either microscopic or profuse, may be present, it seems evident that the difficulties of differential diagnosis at times are insurmountable. True, in most cases of Bright's disease hæmaturia is always microscopic. Indeed, profuse hæmaturia has, until very recently, not been associated with this condition by clinicians. Naunyn's recent report of three cases has directed attention to the possibility of profuse hæmaturia accompanying Bright's disease.

With these difficulties of diagnosis before us it necessarily follows that cases must multiply in which a supposed stone is not found by operation or autopsy, and that many

kidneys explored superficially by inspection, such as an operation permits, would be found seemingly normal. It also follows that explanations of the symptom-complex on some basis other than anatomical would be forthcoming. Because of the absence of such a basis it was natural that the pains should be designated neuralgic, surely an explanation that fails save in the rare cases of renal crises of locomotor ataxia described as long ago as 1876, by Raynaud and Le Reboullet and distinctly allied to the gastric crises of Charcot. It remained for Sabatier, in 1889, to originate the euphonious term hæmaturic nephralgia to designate this group of symptoms, a term which defines concisely, but fails to explain. This is curious, since in one case Sabatier found a slight inflammation of the kidney, the importance of which in the production of symptoms he failed to recognize.

The same criticism of defining without explaining applies to the more recent terms of essential hæmaturia, angioneurotic hæmaturia, and renal hæmophilia. But these terms are justifiably used when the non-existence of inflammatory or other changes in the kidney has been demonstrated by minute examination of postoperative specimens or by postmortems. How difficult this may be and how slight the changes are illustrated by a kidney removed for essential hæmaturia and presented by Nickolish to the Paris Academy a year ago. In Vienna the kidney was pronounced normal. In Paris, Albarran and Motz found marked evidences of glomerulo-nephritis. That profuse bleeding from the kidney can be a symptom of hæmophilia, various forms of toxæmia or arterio-sclerosis, without local changes in the kidney is not to be questioned. It has also been noticed from normal kidneys after very prolonged exercises, notably horseback rides of many hours' duration. Barring these conditions, does it occur from normal kidneys? According to Schede, this only occurred in six cases, and Israel only concedes two, those of Schede and Klemperer, in evidence of its possibility.

A critical analysis of the conditions found when kidney stone or tuberculosis was fruitlessly sought answers in the affirmative the second question propounded in the beginning of this paper, namely: Are there not other pathological conditions of the kidney, the symptom-complex of which cover to a nicety that of stone? Such analysis furthermore enriches our knowledge of renal pathology by two important data. They are, first, that bilateral, chronic nephritis often manifests itself as a unilateral disease; and, second, that just as tuberculosis or infarct, though hæmogenetic, may be unilateral, chronic interstitial, parenchymatous, and capsular inflammation of the kidney may be limited to one side. Rayer already called attention to a case of this kind in his classical treatise on the kidney. Carefully studied cases of this nature are not numerous. This is my reason for presenting the following case.

W. H. C., aged fifty-eight years, merchant. Family history negative in regard to patient's complaint. Father died at fifty-six years of gangrene of the foot; mother died at seventy-six years of pneumonia. One brother died at sixty years of cancer of the stomach. Patient has always claimed to be of frail health. Had the ordinary diseases of childhood. While in the volunteer navy had malaria. In 1884 he had an attack of scarlet fever; after the attack of scarlet fever he became troubled with what was supposed to be cystitis, for which he was treated from time to time for ten years. In 1860 he had gonorrhœa. About fourteen years ago he had his first attack of pain in the right loin and underneath the lower right ribs; this was associated with a sense of fulness and of soreness. He experienced at the time a sense of abdominal tension, which was relieved when vomiting set in. This was associated with an irresistible desire to urinate; micturition was frequent and very painful. The attack lasted for several days, and was supposed to be appendicitis. The attacks first returned from time to time, and, to use the patient's language, then became more insistent and persistent. The patient has not

been free from pain for a month at a time in the last ten years.

The case had been diagnosed at different times cystitis, appendicitis, pyelitis, stone in the kidney, and floating kidney. When seen with Drs. Stewart and Forchheimer the patient presented the following condition: middle-aged man of nervous temperament and ruddy complexion; shows facial traces of severe suffering. He had been confined to his room for six weeks with pain in the right side of the loin, reflected to the right groin. For the relief of this pain the patient takes two to five grains of codeine daily. During his confinement his temperature was always normal. When the attacks of pain are severest there is frequency of micturition; micturition is painless. He never complains of pain in the region of the left kidney.

Physical Examination. This is negative except for some tenderness on deep pressure in the right costo-vertebral angle and over the right ureteral crossing over the pelvic brim. The kidney cannot be palpated; cystoscopic examination negative. Separation of the urines was not attempted.

Urinalysis. While the patient was under observation fully fifty samples of urine were examined. At times there was a slight polyuria. The urine was always clear and limpid, free from albumin and casts. Every specimen examined when centrifuged presented from five to ten red blood cells in the microscopic field; often they were difficult to discern. Evidences of pyelitis were not found in the urine at any time. Hæmaturia was never manifest to the naked eye.

Feeling nearly certain that the kidney harbored a stone, an X-ray picture was taken. Although it clearly revealed the kidney shadow, it showed no stone. An exploration of the kidney was nevertheless determined on.

Operation at Jewish Hospital, April 21, 1902; oblique lumbo-abdominal incision. When the deeper layers of the perirenal fat were reached they were found much firmer

than normal, and in exposing the capsule of the kidney, firm adhesions to this of the fat layer had often to be divided with knife or scissors. The freeing of the kidney preliminary to incising it was as difficult as I have seen it after long-standing pyorenal fistulæ. The kidney, of about normal size, was quite grayish in color and much firmer to the touch than normal. A stone could not be felt. After placing an elastic ligature in the usual way about the pedicle, the kidney was freely incised in the line first described by Hyrtl, and the pelvis opened. Except for possibly a slight dilatation of the latter, nothing abnormal was found. To the naked eye the kidney section appeared normal, except for a grayish color, which may have been due to the operative ischæmia. A thin section was removed for microscopic study. The ureter was easily probed to the bladder and found normal. The operation was terminated as an aseptic nephrolithotomy. This was, perhaps, a technical error, for a slight infection occurred which delayed recovery. The suppuration was extrarenal. In the course of this a thrombosis of the left femoral vein supervened. On June 5th the patient was discharged from the hospital well, except for a slight swelling of the left foot, the last sequel of the femoral thrombosis. This also disappeared. Since his return from his vacation the patient has followed his affairs, has had no pain of any kind, and repeated examinations of the urine fail to show any trace of hæmaturia. November 1st the patient reports a gain in weight of twenty-four pounds since the operation.

The following is the report of Dr. Hiller on the pathological findings: The examination of the thin slice of kidney substance removed *intra vitam* reveals changes in the parenchymatous elements. Although the glomeruli have generally retained their normal appearance, here and there in areas the normal tangibility is lost, and distinct atrophy with granular change has occurred. The cells lining the tubules show in these areas a granular change with desquamation, the lumen of the tubule being often occupied by

a granular débris in which nuclei are absent. On looking at the apparently normal kidney structure in the slide, the quantity of red blood cells both in and outside of the blood-vessels stand out in bold relief. There is not present any distinct overgrowth of connective tissue, nor are there any bands passing from the capsula propria of the kidney. This structure, although it does not appear thickened, seems unusually dense toward the outside.

Remarks. The case presented evidently is one of atypical chronic inflammation of the kidney. In patches there was a distinct glomerulo-nephritis. From the adherence of the capsula propria to the fat capsule, one might believe that a stone had existed at one time, and was passed. The disappearance of the microscopic hæmaturia after the operation and the disappearance of all symptoms, and the fact that the patient never suffered from pain in the left kidney, make it reasonably certain that the disease in this case was unilateral.

Of considerable importance is the fact that a surgeon should not consider an operation on the kidney in which he expects to find a stone negative in its results when other changes in the kidney, as in the case reported, cover to a nicety the symptoms of stone. The capsule splitting and the section of the kidney will doubtless relieve many cases which simulate stone, and in which, because of the impossibility to make a positive diagnosis, are not now subjected to an exploratory operation.

In conclusion, the author would advise that in every case a small section of the kidney be removed for the purpose of microscopic examination. It is only in such a way that minute changes of the kidney can be discerned, changes which, although seemingly slight, are often capable of producing, as in the case reported, the severest symptoms.

CONDYLOMATA VULVÆ.

By Greer Baughman, M.D.,
Richmond, Va.

Condyloma vulvæ is no new disease. Celsus (30 B.C.–50 A.D.) describes the broad condylomata.[12] Galen (131–210 A.D.) gave the name ἀκροχορδόνες to condylomata acuminata, and μυρμήλια to condylomata lata. Before the condylomata were identified with syphilis they were looked upon as distinct diseases and called mariscæ; later on, in Germany, the different forms received such descriptive names as mulberry, coxcomb, cauliflower, etc. It was Kluge, of Germany, who divided the vegetations of the vulva into condylomata lata, with a broad base, and condylomata acuminata, with a small pedunculated base.[2]

Although both varieties can and do occur in the same class of persons, namely, the uncleanly and those with loose morals, it is usually not very difficult to differentiate them.

The condylomata acuminata are, as a rule, found on the vaginal side of the vulva, on the mucous membrane of the vagina and vestibule. The syphilitic vegetations (condylomata lata), on the other hand, are more frequently met with upon the skin about the vulval orifice, near the anus or the other moist parts of the body.

The condylomata acuminata originate as separate, pointed, granular growths joined to the skin by a small pedicle. These individual granules soon become fused together into a mulberry-like mass and are bathed in a wet, foul-smelling secretion. The condyloma lata rests upon

a base having nearly the circumference of the growth itself. The free surface is covered with a grayish membrane.

No general symptoms accompany the condylomata acuminata. We usually have a history of gonorrhœa, or there are present such conditions as pus in the urethra, both-sided pus tubes, severe leucorrhœa, or symptoms which lead us to suspect that gonorrhœa had existed or is present now. Condylomata lata are very frequently accompanied by mucous patches in the mouth, vagina, or near the rectum, with papular, pustulo-crustaceous or pustular eruption, iritis, general adenitis, etc. Many observers, including Mr. Wm. Dease,[6] Dawosky,[10] Giegel,[13] Skae,[14] have seen condylomata occur without any manifestations of syphilis preceding or following the vegetations. In *Sajous' Annual of the Universal Medical Sciences*, 1901,[14] under the head of "Syphilis," the writer indicates that while these papillomata are in no sense syphilitic, still they thrive best on syphilitic soil. Ravagli, in Reed's *Text-book of Gynecology*, 1901,[20] is quoted as saying that condyloma lata is characteristic of syphilis, and when this variety of condyloma is discovered all doubt as to the syphilitic diagnosis disappears. Most of the condylomata lata which I have seen have been accompanied by other well-marked syphilitic lesions. I have never seen a case where adenopathy was not present. Many of the older writers, including Ricard,[13] Giegel,[13] and Kaposi,[3] assert that this broad-based vegetation may be a primary syphilide and may be transmitted as such. Ohmann-Dumesnil,[7] as reported in his lectures, 1895, is rather of the opinion that the condyloma lata is always a secondary lesion, contact giving a chancre, never a condyloma. A writer in the *American Text-book of Genito-urinary Diseases, Syphilis, and Diseases of the Skin*, 1898,[19] states that the association of condyloma lata and the primary lesion is much more common in the female than in the male.

The condyloma lata and condyloma acuminata differ in their gross appearance, in their position on the body, in

their mode of origin, in their etiology, and also slightly in their microscopic appearances.

The condyloma lata is surrounded by a zone of but slightly altered skin. In this seemingly unaltered skin, lymphoid cells and a beginning periarteritis can usually be made out; but this periarteritis is not pronounced. In the microscopic examination, as we work toward the condyloma proper, we see a lengthening and narrowing of the rete papillæ. They are filled with granular tissue. The chorion above these drawn-out rete papillæ is infiltrated with round cells. The superficial, subpapillary, and papillary vessels seem particularly energetic in this process. A well-marked pigmentation is to be found only in the normal rete papillæ and usually in the deepest row of rete cells, just above the basal line. A perivascular infiltration can be made out in almost every case. This periarteritis, accompanied, as it is, with round-celled infiltration, is more noticeable than changes in the adventitia or intima; but in the small vessels the intima cells are enlarged, the protoplasm crowded, but the nuclei are very distinct. The endothelium looks almost ready to fall off. Toward the surface we find cell-division pictures. In the stratum granulosum, where the nuclei also show a karyokinetic figure, between the nuclei and protoplasm a clear zone is noticed; this looks like a vacuole.

The characteristic appearances are: 1. Small-celled infiltration of the chorion and papillæ. 2. Changes in the epidermis. 3. Disappearance of pigment after healing. 4. Changes in the vessel walls.

The condylomata acuminata are tumors in the true sense of the word. They show proliferation in the epithelium as well as in the connective tissue of the papillæ, while in the condylomata lata the epithelium and connective tissue play a passive rôle.

In the condylomata acuminata we find numerous spindle cells scattered over the specimen; they are probably builders of connective tissue. The condylomata lata, on the other

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hand, have round cells along the vessel wall; these round cells seem capable of no higher development. The capillaries of the condylomata are wide, and endothelium shows signs of proliferation, the medium-sized vessels show but little dilatation and no endothelial change. In the condylomata lata the endothelium of the vessels of all sizes is changed and the outer sheath is thickened.[9]

Condylomata vulvæ are very common among the negro and mulatto women of the South. Their looseness of living, their exposure to syphilis and gonorrhœa, and their uncleanliness make them particularly liable.

Eighteen cases of condylomata vulvæ have been treated between January 1, 1901, and November 1, 1902, in the gynecological room of the Medical College of Virginia Dispensary. Seven were of the condylomata acuminata type; ten of the condylomata lata, with a distinct history and signs of syphilis; one with the appearance of condylomata lata, but without the history or all the signs of syphilis. This woman said she had noticed the wart as long as she could remember.

During this period of time syphilis has been diagnosed in 46 cases, usually in the secondary stage; chancroid in 23 cases, mixed infections in 7 cases, gonorrhœa, usually in subacute form, in 59 cases.

Some of these condylomata are sufficiently interesting to warrant a description.

Case 766.—S. T., aged twenty years, colored; seen for the first time January 15, 1902. Three months before this date she first noticed a sore on the genitalia. One month after the sore an eruption broke out. The present sore began two weeks after the eruption. Examination showed a few pigmented spots on the arms and face; general adenitis, including the epitrochlear and postcervical glands; hair does not come out readily; mucous patches on the inner surface of both lips. A mass of raised membranous covered vegetations is to be seen on the left side of the labium majus, and two in the thighs. The base of these tumors

is as broad and as wide as the free surface of the tumor. These excrescences were diagnosed as condylomata lata. January 22, 1902, the large patch has shrivelled up and almost disappeared.

Case 811.—B. A., aged twenty-one years, colored; no previous history of syphilis. Examination showed general adenitis, including the epitrochlear and postcervical glands; mouth and skin on body free from signs of syphilis; squamous syphilitic patches in both hands and on the soles of the feet; three small, round, elevated, membranous covered warts on the left labium majus and one on the right thigh. Diagnosis: condylomata lata.

Case 842.—S. W., aged twenty-two years, colored. No sore on the genitalia previous to this one. She had an eruption all over the body two months before the sore on the genitals appeared. This eruption faded in one month without treatment. The present sore had been there two weeks. Examination showed pigmented spots on the skin; general adenitis, including the epitrochlear and postcervical glands; no lesions in the mouth or throat; hair does not come out readily. An elevated, membranous covered wart, the size of a silver dollar, was on the right side of the anus. Diagnosis: condyloma lata.

Case 845.—M. G., aged fifteen years, colored. Saw her first October 8, 1902. Had initial sore two months ago, had no skin eruption; hair does not readily come out; no pain in her bones. Examination showed general adenitis, including the epitrochlear and postcervical glands; no skin eruption; no lesions in the mouth; a mucous patch on both labia; an elevated, membranous covered wart was on the right side of the anus, larger than a silver dollar. Diagnosis: condyloma lata.

October 22, 1902. The mucous patch has entirely disappeared and the condyloma much reduced in size.

Case 827.—A. M., aged sixteen years, colored. No history of previous sore or eruption. Examination showed general adenitis, including epitrochlear glands; no sign of

No. 867.

eruption; no lesions in the mouth or throat; a small, raised, membranous covered nodule just beneath the labium minus of the left side. Diagnosis: condyloma lata.

Case 879.—J. R., aged twenty-six years, colored. Saw her first October 24, 1902. Had leucorrhœa for some time; two months ago first sore appeared; three weeks ago first breaking out appeared. Papular syphilides now on the legs and arms; general adenitis, including the epitrochlear and postcervical glands; beginning mucous patches in the mouth; broad, membranous covered condylomata on the genitals; four elevated patches around the anus; mucous patches in the vagina. Diagnosis: condylomata lata.

Case 867.—R. J., aged twenty years, colored. No history of syphilitic sore or eruption; scrofula as a child; no headache; no pain in the bones; no history of jaundice; hair does not readily come out; throat seldom sore; never had sores in the mouth. Examination showed general adenitis, including the epitrochlear and postcervical glands; scar in the neck where the glands had suppurated as a child; no signs of syphilitic sore in the mouth; no eruption on the skin; no signs of sore or cicatrix along the genital tract; an elevated, membranous covered wart about the size of the thumb-nail to the left and somewhat beneath the anus. Diagnosis: condylomata lata (?).

Case 893.—F. J., aged twenty-four years, light colored mulatto. No history of syphilis; no pain on micturition; severe leucorrhœa for some time; saw the first signs of condylomata one year ago as small lump on each side of the vulva. Examination showed the absence of general adenitis; no signs of pigmentation or eruption on the skin; no lesions in the mouth; no pus in the urethra; foul-smelling leucorrhœa; two large tumors on the labia majora, which prevented the vulva being seen; the larger one pear-shaped, lobulated, and situated on the left labium majus, 12.3 cm. long and 5.4 cm. wide at widest part; small one on right labium majus: length, 7.8 cm., width 3 cm. at its widest part. These tumors are connected to the labium on each

side by a pedicle, very thin, but extending the whole length of the tumors. Diagnosis: condylomata acuminata.

The treatment of condylomata vulvæ is followed, usually, by the most satisfactory results. It may be summed up as follows:

1. Treat the cause—syphilis, gonorrhœa, or uncleanliness. 2. Remove the condylomata (*a*) rapidly with actual cautery or cutting instruments, (*b*) slowly, with caustics often applied. 3. Keep the parts clean and dry. Lawrence[1] recommends the local use of Monsel's solution (once or twice a day with a camel's-hair brush). Kaposi[5] isolated the condyloma as much as possible and then applied the pasty part of Plenck's solution (℞.—Hydrarg. chlor. cor., aluminis, cerussæ, camphoræ, alcoholis, aceti vini, āā v). He never saw mercurial poisoning follow this application. Dawosky[10] removed the condylomata with scissors and then applied acid. Codell[10] treated them with chromic acid, six parts to thirty parts of water. Ohmann-Dumesnil[8] used a local application of: ℞.—Hydrargyri bich., gr. vj; ammonium muriate, gr. xij; aquæ dest., ℥vj. Sig.—Apply twice daily. After the solution is applied and the parts are damp calomel powder is dusted on.

He did not use potassium iodide or other preparations of iodine, because the combination of bichloride locally and iodine internally is apt to develop irritative lesions. Nussbaum[10] used a solution of sodium chloride followed by calomel. The method employed at the Dispensary of the Medical College of Virginia is to vigorously treat gonorrhœa or syphilis when present. We use the protoiodide of mercury, $\frac{1}{5}$ gr. three times a day, and push it in secondary syphilis. We instruct the patients to wash themselves thoroughly with castile soap and warm water; dry well and dampen all condylomata with salt (NaCl) water, and, while the parts are still wet, to dust on powdered calomel. This treatment, in conjunction with protoiodide of mercury, is used for all of the condylomata lata. The small condylomata acuminata are treated locally in the same way, or

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they are removed with a curette, after which their bases are burned. The large ones are removed with the knife and their bases are well cauterized, or they are removed with the cautery.

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SPINAL ANALGESIA.

By E. Denegre Martin, M.D.,
New Orleans, La.

Though this subject seems to be growing less popular with the profession and there are many who condemn it as unwise and dangerous, it, nevertheless, has its place, and, personally, I consider it one of the necessary adjuncts to surgery. I have always maintained that we should be cautious in its use and exclusive in its application. When the fad struck New Orleans I felt that I must join the procession and give my class the benefit of this new discovery. Accordingly, I operated upon my first patient on November 9, 1900, using fifteen minims of a 2 per cent. solution of cocaine. The postoperative symptoms in this patient were so violent that I shrank from further experiments. After more careful analysis of this case, with a study of others that were being reported, it occurred to me that those symptoms were not due altogether to the effects of cocaine, but, possibly, to a disturbed tension of the spinal fluid. Acting on this hypothesis, I began at once to use a more concentrated solution.

On January 26, 1901, I read a paper on this subject before the Orleans Parish Medical Society, from which I quote the following extract: "The best result is obtained by using a small amount of a strong solution." This assertion was based upon an experience with nine cases of my own and several reported by Dr. Delaup, who, in concluding his remarks, stated that he was so well pleased with the results obtained in using this concentrated solution that he

would confine himself strictly to this procedure in the future.

After inserting the needle, I allow only one or two drops of the spinal fluid to escape; in fact, only enough to assure me that I have entered the canal, then attach the syringe, filled with cocaine solution, and inject five minims of a 4 or a 2 per cent. solution, thereby disturbing the tension just as little as possible. In one instance, as the report of these cases will show, I injected only two minims of a 10 per cent. solution, with excellent results. From the discussion which followed, I will again quote from this report: "Dr. Parham considered the experiments valuable and, comparing results in other cases to those reported by me, agreed that solutions too weak should not be used. Dr. Souchon corroborated my statement concerning the two cases we had observed together, one of which was his own, upon whom he had been kind enough to allow me to use a concentrated solution." "In support of Dr. Martin's tension theory," said Dr. Delaup, "in which I am inclined, by recent observations, to share, though not to the same degree, permit me to quote," etc.

Dr. Lazard alluded to some forty cases reported by Fowler in which twenty minims of a 2 per cent. solution were used, in all but two of which headache and nausea followed.

Drs. Chassaignac, Dupaquier, and others discussed the subject most favorably. Since that date about fifty cases, so far as I can learn, have been anæsthetized with this concentrated solution and with the most gratifying results.

Notwithstanding the marked improvement in this method I noticed that the patients seemed to do best in certain positions, especially when the head and shoulders were elevated, and in confirmation of this observation, experiments made on two dogs led me to the conclusion that gravity as well as tension might be a factor in the phenomena occurring in so many of these cases. As these experiments on the dogs proved interesting, as well as amusing, I will report one case. This canine belonged to

the species known as a cur, a medium-sized, healthy-looking brute. I injected ten minims of a 2 per cent. solution of cocaine in the lumbar region. In fifteen minutes the dog began to act as if intoxicated. Whenever he attempted to walk he would first look at each foot to see if it was on the floor, not only at the hind feet, but the fore feet as well. On investigation, I found this animal completely anæsthetized. A pin could be stuck into the skin at any point, through the ears, neck, or feet, without causing pain. This condition lasted for more than an hour. There were no postoperative symptoms, so far as we could tell. It now occurred to me that if the spinal fluid, which is inerted and which undoubtedly must act much as the fluid in any tube, changing only when the position of the tube is altered, might have something to do with carrying the cocaine to the upper portion of the cord and thus producing by gravity the grave symptoms noted. Acting upon these two theories I now adopt a procedure in all my cases which I shall later describe, and so uniformly successful have I been that I am anxious, should the opportunity present itself, that some of you may try it, as my observations have been too few from which to draw definite conclusions.

It would be well to bear in mind the susceptibility of some patients to cocaine and not always to attribute the cause to the method.

When possible, I prepare my patient as carefully for cocaine analgesia as for a general anæsthetic, though I would not hesitate to operate in an emergency if the conditions demanded. The lumbar region is asepticized by the usual method. When patients are strong enough to sit up, I place them in the so-called scorcher's position. A point between the fourth and fifth lumbar vertebræ is selected, and a few minims of a weak solution of cocaine is injected into and under the skin. I then introduce the needle as soon as the space between the bodies of the vertebræ is reached, and the needle is pushed in very slowly until the spinal fluid is seen to escape. I never allow more than

one or two drops to flow from the needle. I then attach the needle, loaded with a 4 per cent. solution of cocaine, and inject five minims. No allowance is made for the calibre of the needle, as it is too small to be considered. The puncture is sealed with collodion, the patient is then put in a recumbent position, with the head and shoulders elevated, and this position is maintained for several hours after the operation or until all effects of the cocaine have worn off.

I will now briefly report the cases upon which I have operated with a concentrated solution of cocaine. My experience is that one-tenth of a grain is sufficient for all operations about the rectum, but that more is required for operations on the extremities.

Case I.—Colored female, aged thirty-four years; serpiginous chancroid so extensive that the buttocks had been divided, exposing the coccyx and two inches of the rectum. General condition very bad; temperature 101°, pulse 130; urine contained albumin and casts. Injected five minims of a 4 per cent. solution (cocaine, gr. $\frac{1}{5}$), curetted and cauterized. Operation painless; anæsthesia complete in ten minutes, lasted one hour and twenty minutes; absolutely no after-symptoms. Patient continued to grow weaker, and died on the fourth day.

Case II.—Colored female, aged sixty years. General condition bad. Suffering from septic fever, the result of traumatic gangrene of the left leg extending to the knee. Pulse 90 and small, temperature 100°. Used five minims of a 4 per cent. solution (cocaine, gr. $\frac{1}{5}$). Complete anæsthesia in seventeen minutes. Amputated at lower third of thigh. Condition slightly improved on evening of the operation. *No after-symptoms whatever.* Twenty-four hours after operation temperature rose to $101\frac{4}{5}$° and continued to fluctuate between 101° and 102°. Examination of stump showed that gangrene was extending. Condition remained practically unchanged until death occurred suddenly six days after operation, undoubtedly due to embolus.

CASE III.—Colored female, aged seventy-five years. Gangrene of foot. General condition very bad. Anterior curvature of the spine. Injected five minims of a 4 per cent. solution (cocaine, gr. $\frac{1}{5}$) at eighth dorsal interspace; anæsthesia complete in fourteen minutes. Operation painless; absolutely no after-symptoms, not even elevation of temperature. Died two weeks after operation, from old age.

Three days before, in this same case, I attempted to reach the canal between the fourth and fifth lumbar vertebra, but failed to get the fluid for some unknown reason. It was this failure that caused me to inject higher.

Post-mortem revealed marked anterior curvature of the spine, with ankylosis, but canal normal. Dr. Laplace relates a similar experience with one of his cases.

CASE IV.—Colored female, aged twenty-five years. Suppurative arthritis of the knee. Temperature at time of operation, 100°; pulse, 90. Injected five minims of a 4 per cent. (cocaine, gr. $\frac{1}{5}$) solution. In nine minutes anæsthesia was complete. Although the limb was so painful before injection that she could scarcely bear the weight of the hand upon it, under anæsthesia she could use it freely, and manipulation was absolutely painless. Explored, found no pus, although two ounces had been withdrawn the day before; knee bandaged and patient removed to ward. One hour later patient had a chill, followed by elevation of temperature, nausea, and vomiting; a second chill six hours after, temperature running up to 100°; pulse, 135, but no nausea and no headache. Temperature next morning was 102°, but no other symptoms. Temperature still continued two weeks after operation, though quite low, ranging from 99° to 101°. Was this due to sepsis from the joint or to the lumbar puncture? If to the latter, the symptoms subsided in a remarkably short space of time.

CASE V.—White male, aged fifty years. Stricture of the urethra; general condition fair; heart weak; had taken chloroform for previous operation, but badly, and spinal

analgesia was decided upon. Five minims of a 2 per cent. solution (cocaine, gr. $\frac{1}{10}$) injected. Anæsthesia complete in eight minutes. He had absolutely no symptoms following.

Case VI.—White male, aged about fifty years; very nervous and anæmic; ulceration of the rectum. Injected five minims of a 2 per cent. solution (cocaine, gr. $\frac{1}{10}$). Anæsthesia in six minutes. No after-symptoms whatever in this case.

Case VII.—White male, aged about fifty years; very anæmic; both heart and kidneys seriously involved; gangrene of stump of amputation. Injected five minims of a 4 per cent. solution (cocaine, gr. $\frac{1}{5}$). Anæsthesia in ten minutes. Amputated lower third of the thigh. No after-symptoms in this case.

Case VIII.—Colored female, aged fifty-three years; condition fair. At time of operation pulse 110. Malignant tumor involving scarpal glands, suppurating at time of operation. Injected two minims of a 10 per cent. solution (cocaine, gr. $\frac{1}{5}$). Operation painless, though sensitive to touch, heat, or cold. Pulse after operation, 94; no after-symptoms.

All of these cases were in a very bad condition, and some of them would have met with immediate and certain death under general anæsthesia. (Reported from the *Transactions of the Orleans Parish Medical Society*, 1901.)

Case IX.—Amputation of leg in middle third; colored female, aged sixty years; traumatic gangrene. Albumin and casts in the urine. Suffering from septicæmia and endocarditis. Injected five minims of a 4 per cent. solution; effect in fourteen minutes. No after-effects. Patient died on the seventh day; death due to shock and the gangrenous condition.

Case X.—Polypus of the uterus; white female, aged thirty years. Urine normal; heart normal; pulse 130; very nervous. Injected five minims of a 5 per cent. solution. Effect in twenty minutes; analgesia never complete in the uterus; some pain throughout the operation; no after-effects.

This injection was made for another physician. The patient could have taken a general anæsthetic, but the physician desired to test the effect.

Case XI.—Fissure in ano; white male, aged twenty-six years. Urine, etc., normal. Injected five minims of a 2 per cent. solution; effect in seven minutes. Slight headache; vomiting twice in twenty-four hours.

Case XII.—Fistula in ano; very extensive; white male, aged seventy-two years. Endocarditis; urine normal. Injected five minims of a 4 per cent. solution; effect in nine minutes. No after-effects.

Case XIII.—Ulcer of leg (grafted); colored female, aged nineteen years; general condition bad; syphilitic. Right lateral curvature of the spine. Injected five minims of a 4 per cent. solution; on the left side (side of ulcer) analgesia only partial. Shaving of ulcer very painful; could not take grafts from the thigh. On the right side analgesia complete and grafts removed without pain. At 8 P.M. temperature had risen to 100°; slight headache, relieved by phenacetin and caffeine; no further symptoms.

Case XIV.—Urethrotomy (very extensive) without guide; colored male, aged twenty years; condition normal. Injected five minims of a 4 per cent. solution; effect in five minutes. Operation lasted forty minutes; no after-effects.

There were only a few drops of spinal fluid lost in each case.

Case XV.—B. S., male, aged fifty-eight years; chronic alcoholic; condition fair. Operated upon for fistula extending four inches up the bowel. Injected five minims of a 4 per cent. solution; anæsthesia in six minutes. Operation lasted twenty-five minutes; no pain; no after-effects whatever. (*Transactions of the Louisiana State Medical Society*, 1902.)

Case XVI.—Mr. M., white, aged fifty-five years; gangrene of the perineum, due to infiltration of urine; temperature 102°, pulse 120; general condition very bad. Injected five minims of a 4 per cent. solution of cocaine;

analgesia complete. Operation lasted half an hour; no after-effects.

Case XVII.—Mrs. S., white, aged forty-nine years; hemorrhoids; suffered with valvular heart disease; general condition bad. Had been refused relief by several physicians, on account of heart disease. Injected five minims of a 4 per cent. solution of cocaine; analgesia complete. No after-effects whatever.

Case XVIII.—R. B., aged fifty-six years, white male. Epithelioma of the prepuce; general condition bad. Injected five minims of a 4 per cent. solution of cocaine; analgesia complete in ten minutes. Operation lasted twenty minutes; absolutely no postoperative symptoms.

A note received from Dr. Delaup on November 1st tells me he has used a concentrated solution of cocaine in thirty-three cases; that he is confirmed in the belief that it is best. The only unpleasant symptoms were an occasional headache and slight nausea.

A CASE OF OVARIAN FIBROMA.

By H. A. Royster, M.D.
Raleigh, N. C.

At the last meeting of the American Gynecological Society, Dr. Reuben Peterson, of Ann Arbor, Michigan, read a paper entitled "A Consideration of Ovarian Fibromata, Based on a Study of Two Recent Cases and Eighty-two Collected from the Literature" (*American Gynecology*, July, 1902). A few days after reading this valuable contribution, I came unexpectedly upon a case of this kind and deem it worthy of a simple recital, together with the pathological report and a few clinical facts in regard to this uncommon condition.

Mrs. G. (referred by Dr. J. A. Williams, of Reidsville, N. C.), aged fifty-five years, weight one hundred and eighty pounds, was admitted to Rex Hospital, September 20, 1902. She had borne seven children, all her labors being difficult. Her menses began at fourteen years and gave no trouble at first. After marriage she began to suffer from profuse menorrhagia and metrorrhagia. At the age of twenty-five years a small growth, probably a polyp, was removed from the cervix. The menopause came at the age of fifty years, but about two years ago the flow recurred, lasting ten days or more. It was not now so excessive and appeared only at irregular intervals, a space of twelve months having passed since she had her last severe hemorrhage. She complained of pain in the left side and around the umbilicus and a burning sensation in the chest. Urination was difficult and frequent. Her general condition was good.

Examination revealed a very hard, smooth tumor in the posterior cul-de-sac. It was about the size of a large orange and was somewhat movable. The uterus, apparently of normal size, was pushed upward by the mass, and seemed to be connected with it posteriorly. Diagnosis: Fibroma of the uterus.

Operation, September 23, 1902. The abdomen was opened by a four inch median incision. A small quantity of ascitic fluid was present. There were no adhesions and the tumor was easily brought up and delivered. It was a dense, somewhat flattened mass, attached by a pedicle to the right broad ligament. This pedicle was tied with a double ligature of silk and the tumor removed. The peritoneal cavity was sponged out dry and the wound closed with the tier suture. The uterus was normal and the left ovary was atrophic. The patient bore the operation exceedingly well, only twenty-five minutes having been consumed in the entire procedure. The result was an uncomplicated convalescence and restoration to perfect health.

Pathological Report by Mr. William De Berniere MacNider.

Gross Appearance. Upon a single macroscopic examination of this tumor it was noticed at once that there are two seemingly different portions: First, an upper portion, the transverse diameter of which measures 5 cm., and, secondly, a lower and much larger portion, the diameters of which are as follows: transverse diameter 8 cm., vertical 10 cm. The entire tumor weighs 451 gms., its greatest circumference being 26 cm. The superior and smaller portion of the tumor consists of five nodular areas which are separated by comparatively deep sulci, and in these sulci are seen dense bands of fibrous tissue which radiate from a common origin on the posterior surface. In the centre of this nodular area there is a depression, and here the several fibrous bands seem to converge and by their contraction form a puckered ap-

pearance. Upon sectioning these nodules one is struck with their density, and the creaking sound of the knife is very noticeable as well as characteristic of this condition.

The lower and larger mass may be divided for convenience of description into an anterior, posterior, superior, and inferior surface.

The general contour of this mass is comparatively regular when compared with the upper or nodular portion, but upon palpation numerous hard areas are found which do not project from the surface of the tumor. The vascular supply of the tumor is rather poor, but especially upon the anterior surface can be seen several bloodvessels having a very tortuous course.

On the posterior surface there is noticed a dense mass of white fibrous tissue which is continuous above with the smaller nodular area and below with the inferior surface, where it spreads into a dense layer. Extending laterally from this superficial fibrous layer on the posterior surface are two distinct bands which pass forward and unite on the anterior surface of the tumor in a sulcus which separates the upper from the lower portion. This sulcus, which is situated on the antero-internal aspect of the tumor, has a depth of 1 cm. and in the sulcus is situated the pedicle of the tumor, measuring 1 cm. Above and parallel to the pedicle is the right Fallopian tube with its fimbriated extremity, the tube being attached to the pedicle by a portion of the broad ligament. There is no sign whatever of an ovary and upon section no ovarian tissue is encountered; but in its place a dense, fibrous mass. Upon making a vertical median incision through the lower and larger portion of the tumor, the same tough, dense tissue is encountered for a distance of 3 cm. After this region is passed the tissue seems to become much richer in cells and is not so dense until the upper nodular area is reached, where the density becomes more marked than ever. On the interior of the tumor fibrous bands are seen running in different

directions, for the most part longitudinally, while some are seen to have a semilunar or whorl-like arrangement.

Microscopic Examination. For the microscopic examination a portion of tissue was taken from one of the nodules and a second portion from the body of the tumor. The tissue from the nodule is characteristic of fibroma durum. It consists of dense bands of fibrous tissue with few cells and bloodvessels. The fibrous element is chiefly arranged in whorls, while many of the fibres can be seen running in various directions. The tissue taken from the body of the tumor presents near the surface the same characteristic appearance, but upon examining that portion of the section nearest the middle of the tumor it is found that the fibrous element decreases, fatty changes appear, the cells and bloodvessels becoming more numerous, until the cellular element predominates.

Remarks. According to the statistics gathered by Peterson, there are no uniform symptoms of ovarian fibroma. The tumor may be of slow growth and give no special signs of its existence, or it may increase rapidly in size, so that it would be noticeable in a few months. Abdominal pain and difficult micturition are regarded as usual symptoms, while menorrhagia and metrorrhagia are not very constant.

In the discussion which followed the paper above referred to it developed that Mann had seen six cases of fibroma of the ovary, Howard three cases, Henrotin three, Whitridge Williams three, and Gordon two. Howard also stated that Sir Spencer Wells out of 1200 ovariotomies saw only three cases and that three fell to the lot of Goodell. Kelly (*Operative Gynecology*) says that ovarian fibromata are among the rarest of pelvic tumors. In 1200 abdominal sections he saw four cases. Some authorities put their frequency down as low as 2 and 3 per cent. The case herewith reported is the only solid tumor of the ovary I have encountered in over 250 abdominal operations. Peterson thinks they are not so rare as was formerly supposed.

The frequency and significance of ascites with fibroids

of the ovary do not seem to be definitely settled, nor is its cause apparently determined. Peterson believes that ascites occurs in 40 per cent. of cases, and that the greatest amount is not produced by the large tumors. It was present in all of Kelly's cases save one, and that one was of only the size of a walnut. Lapthorn Smith considers the association of ascites with an abdominal tumor as "strong presumptive evidence in favor of its being malignant." Osler is inclined to this view with especial reference to solid ovarian growths. Since ascitic fluid occurs with the smaller as well as, if not more frequently than, with the larger tumors, it is probable that pressure has little to do with its accumulation, and it has been suggested, with some reason, that it may be due to local irritation of the peritoneum (Henrotin). In most cases the tumor has a long pedicle, which allows it free play. Discussions of the subject of ovarian fibromata will usually bring out the fact that their diagnosis is a matter of difficulty and that most operators stumble upon them unawares.

FRACTURE OF THE SPINE: THREE CASES.

By Howard J. Williams, M.D.,
Macon, Ga.

The following cases are reported with no hope of adding anything new to the labors of such neurologists as Thorburn, Starr, Kocher, or Wichmann, in the study of spinal localization, nor can I expect to suggest anything in the treatment of these traumatisms beyond a confirmation of the work of such surgeons as Horsley, Keen, Schede, and Lloyd. The three cases simply illustrate the paralytic, anæsthetic and reflex inhibitory manifestations attending compressive and destructive lesions of the spinal cord resulting from fracture of the vertebræ located respectively in the cervical, the dorsal, and the lumbar regions. As they were fatal cases, in two laminectomy having been performed, I shall call attention to the errors in their treatment, with the desire that the discussion may bring out suggestions which will be of value in the future management of similar conditions.

Case I. *Fracture of the sixth cervical vertebra; bilateral paralysis of the wrist, fingers, and intrinsic hand muscles; bilateral anæsthesia of the inner border of the forearm and ulnar side of the hand, and complete paraplegia below the third rib; sudden death in twenty-seven hours; post-mortem.* —H. J., male, aged thirty years, colored, brakeman, fell off a freight train at 4 a.m., June 26, 1900, and was brought to the Macon Hospital two hours later. He had sustained a lacerated wound over the right eye, exposing the skull, and could not move his body or lower extremities. He was

unconscious when found, but regained consciousness before coming to the hospital. Shock was severe, yet he complained of no pain except when the wound of his forehead was sutured. There was a perceptible though not a marked depression of one of the lower cervical spines, with slight crepitus on gentle manipulation. Temperature, 97.6°; pulse, 50; respiration 16, on admission. He was placed upon his back on a hard mattress with the head fixed between sand-bags; restoratives were employed to promote reaction.

Careful examinations conducted during the day revealed total loss of both muscular power and sensory control below the third rib, with a band of hyperæsthesia extending around the chest above the rib, and absolute loss of all reflexes below the hyperæsthetic band. The breathing was diaphragmatic, the chest muscles taking no part in respiration. Priapism was not observed. Vesicorectal paralysis was present. The pupils were contracted and would not dilate on pinching the sides of the neck. The arms could be moved at the shoulder-joints with freedom; the forearms could be flexed and extended on the arms comparatively well; complete extension, however, was imperfect; pronation and supination were slow; flexion of the wrists and fingers was lost, but placing the wrists in the position of extreme flexion, the man could extend the hands; there was complete loss of extension of the thumb as well as all use of the smaller hand muscles. Sensation was lost in the ulnar side of the hands, the little, the ring, and the inner border of the middle fingers; and both palmar and dorsal surfaces; this area of anæsthesia extended up the inner border of the forearms and arms to the axillæ, with diminished sensation of the anterior surface of the arms. (Fig. 1.) Tapping the anterior tendons of the forearms caused no flexion of the wrist, and the palmar reflexes were lost; the other reflexes of the arms and forearms were present.

His condition remained practically the same during the

night, except that the pulse became intermittent and he was restless during the early hours of the second morning. At 7 A.M. he asked the colored orderly in the ward to turn him on his side. After being turned, and before the orderly had walked the length of the ward, the man ceased breathing.

On post-mortem examination the arch of the sixth cervical vertebra was found to be broken through the pedicle on the left and the lamina on the right side. There was no dislocation or injury of the body of the vertebra. The dura was intact, but was red and injected. On opening the membranes only a small quantity of extravasated blood was observed, the hemorrhage not extending above the fifth and only a little below the seventh vertebral region. The spinal cord looked as though it had been pinched completely across by the depressed arch of the broken vertebra, the crushed section not being over half an inch in length; the segments above and below were not mutilated and only slightly injected.

The paraplegia in this case was evidently due to the crushing of the eighth cervical segment of the cord as it lies under the arch of the sixth vertebra. The symptoms were well defined, the area of the cutaneous anæsthesia, the distribution of the muscular paralysis, and the lost reflexes corresponded accurately with the symptoms enumerated for the eighth segment in Starr's tables for spinal localization. The cause of the fracture was doubtless the fall upon the forehead, in which the lacerated wound over the right eye was received, this sudden backward bending of the neck caught the sixth arch between the spine of the fifth and arch of the seventh vertebræ, breaking it and wedging the fragment in upon the cord. The immediate cause of the sudden death was no doubt some interference with the phrenic nerve when the patient's position was changed, arresting the action of the diaphragm. Park locates the centre of control of the diaphragm in the third cervical segment, but the phrenic nerve receives a branch opposite

the sixth vertebra, and a sudden crush of this branch may cause a reflex interference with the respiratory centre.

In the management of this case I regret that I did not at once fix the neck, head, and shoulders in a plaster-of-Paris dressing. It is possible that in turning the man in bed, the orderly gave the neck such a twist as to have caused the complete severing of a badly compressed and contused cord. I do not doubt that the final result would have been the same, however; nor do I think any operative treatment would have been of material benefit in the case had the patient's life been prolonged; still, in the light of recent progress in spinal surgery, the possibilities of myelorrhaphy are alluring.

CASE II. *Gunshot fracture of the fifth dorsal vertebra; complete transection of the cord; paraplegia; laminectomy; death on the ninetieth day.*—W. F., male, aged twenty-four years, colored, farm hand, was shot in the upper dorsal region, 10 P.M., December 26, 1901, and lay exposed to a December rain until 6 P.M. of the following day. He stated that he fell and was helpless immediately after being shot, but never became unconscious. He was taken to the Roff Home, and I was requested to see him on the fourth day. Paraplegia, anæsthesia, and abolished reflex action were complete below a line extending from the sixth dorsal spine to the ensiform process. Urinary incontinence from over-distention was present, tympany and fecal retention coexisted; bed-sores were beginning on the nates. Pulse 86, respiration 20, temperature 98°. The ball, 38 calibre, had entered the back one and a half inches to the right of the fourth dorsal spine. The indications were that the cord had been severed, but upon his own solicitation, I operated December 31st, ether anæsthesia being employed; Dr. J. E. Wright, Dr. H. P. Derry, and Dr. H. D. Worsham were the attendants. An incision six inches in length exposed the spines and laminæ from the third to the seventh vertebræ. The lamina of the fifth vertebra was found to have been penetrated by the missile; none of the neighboring vertebræ

was injured. The spine of the fourth and arch of the fifth vertebræ were removed. The inner surface of the arch had been destroyed, and the bullet was found buried in the body of the vertebra. The cord was completely destroyed for a space of five-eighths of an inch in length. Some escape of cerebro-spinal fluid occurred after the canal was cleared of blood clot and fragments of bone. A probe passed along the canal detected no obstruction; the wound was therefore irrigated with salt solution and closed with deep interrupted silkworm sutures without drainage.

The temperature rose during the next twenty-four hours to 101°, but gradually declined to 99.2° on the sixth day. On the twelfth day the stitches were removed, primary union having taken place. The bed-sores, in spite of careful attention, grew rapidly worse, covering the entire buttocks and forming later on the posterior surface of the calves of the legs. Soon after the operation the feet began to swell, the swelling gradually extending up into the thighs. The upper part of his body, arms and face emaciated, and by the twenty-third day a severe cough had developed. Strange to say, the man's appetite and digestion were at no time affected. The bowels were kept unloaded by salines and enemata. Careful catheterization preserved the bladder from infection until late in the progress of the paralysis, pus making its first appearance in the tenth week. In the seventh week he claimed he could tell when the bowels would move and thought that he had some control over the bladder. These statements were confirmed by his attendants, but, as there was at no time any evidence of returning muscular power, sensory control, or recovered reflexes below the chest, these signs of improvement must have been imaginary. On March 26, 1902, just three months from the day he was shot and twelve weeks after the laminectomy, he died of septic infection.

I was extremely anxious to examine this man's spine after death, but he died while I was temporarily absent from the city, and no autopsy was made.

The sixth dorsal segment of the spinal cord resting opposite the fifth dorsal vertebra was the portion of the cord destroyed in this case. The point of interest in the case just at present is the prolonged duration of life after complete section of the cord by a gunshot wound. In the references at hand of cases of gunshot wounds of the spine which have come to operation, five in number, three alone were cases of complete section of the cord. One recovered, the case reported by Drs. F. T. Stewart and R. H. Harte, notable because of its being the first recorded case of successful myelorrhaphy in the human being. Case 166, in Dr. Lloyd's references, a complete destruction of the cord, died on the twenty-first day after operation; case 167, of the same references, similar in character, lived thirty-one days. Both of these were in the upper dorsal region. My case lived eighty-six days after operation. Dr. Lloyd and Dr. F. H. Harrington, of Pawtucket, R. I., each report a case of gunshot fracture of the spine with compression, successfully treated by removal of the depressed lamina. These two cases, cases of compression without destruction, cannot be classed with those of complete section of the cord; the condition is not so fatal, and prompt elevation of the compressing bone successfully re-establishes the functions of the spinal cord.

Although poorly prepared to give the careful attention which such cases require, I am sure that this man's life was prolonged by the extreme care and cleanliness of two ignorant but faithful old negro men, attendants at the Roff Home, the county poor-house. It would seem, however, from a careful review of many recorded cases, that while the fatality of spinal injuries decreases from the cervical to the lumbar regions, the upper dorsal region is the most tolerant of injury; that is, the average duration of life after injury is longer in this section of the cord. Perhaps this is due to the protection afforded by the fixity of this location against the disturbances of motion so dangerous in the cervical region, and the protection against wound infection

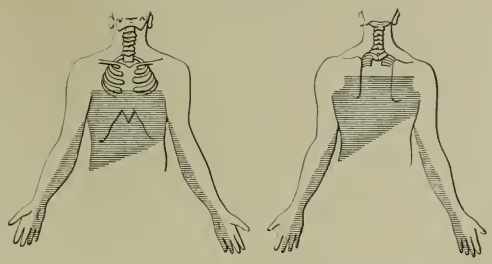
afforded by the distance of the dorsal region from the usual sources of soiling, the escape of urine and feces, and the discharges from bed-sores over the sacrum and nates.

Case III. *Fracture of the first lumbar vertebra; motor paralysis below the great trochanters; sensory paralysis below the knees; laminectomy; death on the nineteenth day.*—R. S., male, aged forty-three years, Italian, fruit vender, on October 5, 1900, while attempting to place his fruit-stand on a dray, fell; the stand falling upon his abdomen, the small of his back was crushed against the edge of the curbing. He did not lose consciousness, but suffered excruciating pain, and could not rise. His family physician, Dr. J. W. Lee, removed him to the Macon Hospital and asked me to take charge of the case.

Shock was severe; temperature 97.3°, pulse 76, respiration 24. There was no external wound; but discoloration with bogginess of the soft tissues was present over the dorsolumbar space, and an irregularity of the spines of the vertebræ existed in the upper lumbar region. Girdling pain was felt around the pelvis; complete anæsthesia existed over the scrotum, penis, perineum, and below the outer condyles of the knees to the toes as well as in the back part of the thighs. Sensation was delayed from the middle of the anterior part of the thighs and inner side of the calves. (Fig. 2.) Bilateral paralysis was present in all of the leg and thigh muscles except the psoas group. Cremasteric reflex was present, knee-jerk slow, plantar reflex absent. During the first twelve hours it was found that incontinence of urine and feces existed; priapism was present.

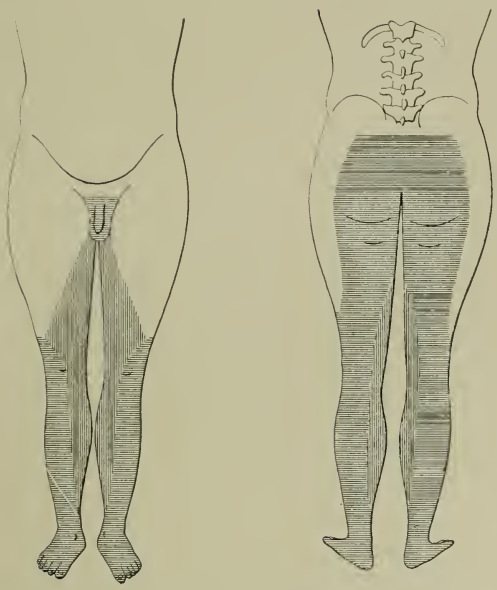
The patient was placed on his back, extension and counter-extension applied, and anodyne treatment employed while awaiting developments. During the next two days but little change in his condition occurred. The evening temperature rose to 101° with a morning intermission; the urine had a specific gravity of 1030, and contained albumin and sugar. October 7th, he could move his adductors and rotate the thighs slightly; sensation in the outer side of

Fig. 1.



Shaded lines, area of anæsthesia.

Fig. 2.



Horizontal shading, complete anæsthesia; vertical shading, delayed sensation

the legs was slowly returning, that of the right leg being most markedly improved. No improvement in the reflexes could be observed. The rectovesical symptoms remain unchanged.

On the 9th bed-sores on the nates were starting, but the improvement in motion and sensation was such as to justify the belief that the cord was not destroyed, and laminectomy was decidedly indicated. Assisted by Dr. N. T. Carswell, Dr. Lee, and Dr. H. P. Derry, I operated, ether being employed. An incision beginning at the spine of the eleventh dorsal and ending with that of the fourth lumbar vertebra, was made; the soft parts, badly bruised and infiltrated with blood, were separated from either side of the spines and the laminæ exposed. The spine of the twelfth dorsal and the lamina of the first lumbar vertebræ were observed to be broken and depressed. The twelfth dorsal, the first and the second lumbar arches were removed. After the usual bleeding was arrested and old clots removed it was seen that the dura was not lacerated, but was contused to the extent of an inch and a half or more. The dura began to pulsate as soon as the pressure was removed, so it was decided not to open the membranes. There was no displacement or injury of the bodies of the vertebræ. The wound was washed out with hot normal salt solution and sewed up, drainage being employed; a heavy iodoform gauze dressing with a spinal splint of woven wire was applied and the patient returned to bed.

Reaction was good; the temperature ranged between 99° and 100°, with a pulse of 88 to 110, for the first few days. The drain was removed on the fourth day, the wound looking healthy. By the eighth day after the operation he could move the thigh muscles, bend the knees slightly, and flex the toes of the right foot feebly. He could feel the prick of a pin quite well over the outer side of the right ankle and leg; sensation was delayed in the left calf; knee-jerk was marked. On the eighth day, feeling an inclination to urinate, he voluntarily passed his urine in the bed, greatly

to his joy, but unfortunately soiling the bedding and his dressings. The next day his temperature rose from normal to 102.4°. Exposing the wound, a dark, grumous discharge exuded, the stitches were removed and the wound was washed out. This was followed by a fall of temperature to 98.8°. After this the wound required daily attention. On the twelfth day he began to be slightly delirious, had some stiffness of the neck, with a rise of temperature and pulse. Evidently a septic meningitis had developed. From this time he rapidly grew worse; opisthotonos, wild delirium, convulsions, high pulse, and rising temperature came on. He died October 23, 1900.

No post-mortem was allowed.

Comparing the distribution of the cutaneous anæsthesia in this case with the charts of Starr, Wichmann, and Head it is evident that the involved segment of the cord was the fifth lumbar, with some irritation of the fourth; the distribution of complete anæsthesia in the case, however, somewhat overlaps the areas outlined by Starr for the sensory distribution of the fifth lumbar segment. The incomplete anæsthesia of the inner parts of the legs and the anterior portion of the thighs, the impaired but not lost patellar reflex, with the very early improvement of the muscular control of the adductor group, indicates some degree of compression of the cord above the first lumbar vertebra.

The fatal result in this case is clearly due, in my opinion, to the employment of drainage in the after-treatment. The evidence of beginning primary union on the fourth day proved that the wound was then in a healthy condition, and had the drain not been employed the deep parts of the wound would have been sufficiently united to protect the cord from infection by the soiling of the dressings at the time when the patient voluntarily urinated without using the proper utensils for protecting his bedding. Primary union without drainage in the other case and secondary infection in this one convince me that drainage in such wounds is not only useless, but is attended with danger.

In reviewing the recently reported case of myelorrhaphy performed by Drs. Stewart and Harte, in which the spinal cord at the seventh dorsal vertebra was completely severed by a pistol ball, I was impressed with the similarity between the conditions present in their case and in two of mine. In their case there was a separation of three-fourths of an inch between the distal and the proximal ends of the cord, without any extensive mutilation of the severed ends and very little hemorrhage or destruction of the bony and membranous coverings of the cord. In my first case, here reported, only one-half an inch of the cord was injured; in Case II. the ball cut out a section five-eighths of an inch long; in both the ends of the cord were not mutilated, the hemorrhages were slight, and the fractures limited; in Case II. that portion of the membranes traversed by the bullet was alone destroyed, in the other the dura was uninjured. These conditions would seem to be quite essential for the successful performance of the operation. Drs. Stewart and Harte succeeded in bringing the ends of the cord together and suturing them with some little difficulty over the distance of three-fourths of an inch; in my cases the approximation, I think, could have been accomplished with less difficulty. My second case would have been an ideal one for the trial of this new operation, and, since reading the reports of these operators, the question has suggested itself: would it not be justifiable in a case similar to my first, in which the extent of the destruction is limited but complete, to exsect the mutilated or crushed portion of the cord and approximate the freshened ends with sutures? What might be the results in the cervical segments would, of course, be extremely problematical; how much manipulation this portion of the cord can endure, and how much loss of tissue it could safely sustain should resection be performed, no one knows. One feels, however, that there is little hope of successful results from myelorrhaphy so near the great trophic centres high up in the cord, and the risks of paralysis of the phrenic nerve would make the

operation an extremely hazardous one. Lower down in the cord the results of this successful case demonstrate the possibilities of the operation, and other successes will be reported from time to time. To what extent the cord can be resected and reapproximated with restoration of good functional results will depend, I should think, upon the amount of tension the nervous elements could sustain and still transmit nerve impulses; the tensibility of the cord will, of course, depend upon its looseness in the spinal canal. In this recent case, three-quarters of an inch was lost and the ends reapproximated; still restoration occurred; in the cadaver one inch of the cord has been removed, and yet the ends could be stretched and brought together.

Previous to the appearance of the reports of this case, resection of the cord had been experimentally performed on the lower animals, but without success, and, as Lloyd says, regeneration of the cord after complete destruction of its nervous elements was regarded as absolutely hopeless. This case now reopens the question, and the surgical world has received a fresh impetus for renewed efforts to overcome these hopeless lesions. Why should not restoration of continuity and renewal of functions follow the approximation and suture of the highly-organized cord, as well as it follows upon ordinary nerve suture? We read of cases of paralysis cured by simple extension and counter-extension in cords compressed by fractured vertebræ; in these cases is it not probable that besides the compression there is also some laceration of the nervous elements? McCosh, Lloyd, and others report cases of successful recoveries after laminectomy in old cases in which, besides the depressed bone, inflammatory changes in the membranes and cord have been found. If these cases are dependent upon compression alone the recoveries should be rapid, but usually the functions are restored by a gradual process. No doubt this gradual improvement is due in part to the regeneration of the injured cord. Fickler, in 1899, published two cases of compression of the cord from caries of the vertebræ, in

which he found a number of well-constructed nerve fibres emerging above the point where the compression had been located and returning into the cord below. As the cases had showed marked improvement in the symptoms after the affection had persisted a certain length of time, he accepted them as evidence of a regenerative process on the part of the spinal cord. Bielschowsky has reported a similar discovery in a case of compression. These cases suggest the conclusion that if the possibility of recovery exists in cords which have gone for a long time unrelieved of compression, new myelin sheaths developing around uninjured axis cylinders, revivification of nerve fibres long compressed, and even new fibres forming around points of obstruction, regeneration should take place between the ends of a severed cord when accurately approximated. Chipault speaks of two zones of injury in all crushing traumatisms of the cord, a zone of actual destruction and final necrosis of the nerve elements, and a zone above and below the first, in which there is injury but not destruction of the nervous elements, and in which, after a few days, the nerve cells increase in size, their protoplasm becomes granular, the axis cylinders change, and the myelin breaks into segments. This he calls the beginning of degeneration. May it not, on the contrary, be at first an effort at regeneration, a readjustment of the severed parts aborted finally by the intervening necrosed elements? Lloyd says that if the cause of compression is removed, both axis cylinders and myelin may in a few days begin to undergo regeneration. Is it not possible that the same process may take place if the zone of complete destruction is early removed and the zones of less injured nervous elements are brought together, regeneration then beginning, union should take place across the intervening space? This possibility has been demonstrated in the case of Stewart and Harte.

Instead of waiting for several days to ascertain whether the cord is completely destroyed or simply compressed, I believe we will now operate earlier in all cases of spinal

fracture and oftener in the severer cases, knowing that even if the cord is completely crushed the destroyed zone may be removed and the ends approximated, with hope of successful union. Keen's rule that after the accident, if the knee-jerk is absent and remains so, operation is contra-indicated, should hold good no longer; the absence of the deep reflexes should now be the most urgent reason for prompt exploratory operation, for it demonstrates that the cord is severed and, if possible, its continuity should be restored at once. Lloyd's reason for early operation—to antedate the stage of secondary degeneration and take advantage of the possibilities of early regeneration—will apply with equal force to the employment of myelorrhaphy in spinal crushing and to laminectomy in spinal compression. Laminectomy does not materially endanger life, nor does it unfavorably affect the course of the case; it will now open a way by which myelorrhaphy may possibly relieve the lesion and perhaps restore the patient to a fairly comfortable life.

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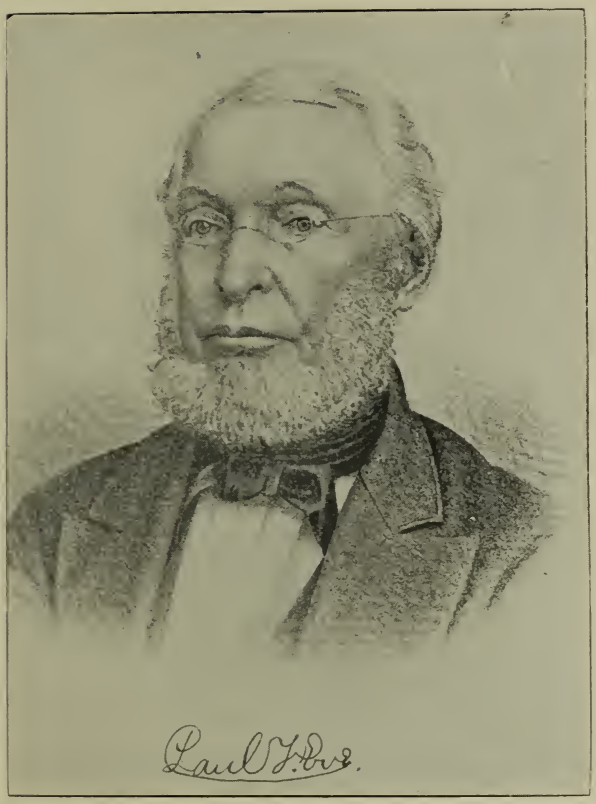


PAUL F. EVE.

(Memorial, in Transactions, 1896.)

WILLIAM DAVID HAGGARD.

IN MEMORIAM.

WILLIAM DAVID HAGGARD, M.D.

FOUNDER AND FIRST PRESIDENT.

William David Haggard was born in Marion County, Kentucky, October 17, 1826. He was the eldest son of the fifth generation of his name, the first of whom came to America from England in 1698, and settled in Albermarle County, Virginia. His great-grandfather emigrated in 1788 to Clark County, Kentucky to join a colony of pioneers who had recently settled that section, and who counted Daniel Boone among the number. The house, which was built of hewn cherry logs with port-holes for defence against the Indians, is still standing near Winchester, and the tract of land upon which it is built has been in possession of the family for over two hundred years.

Born in an adjoining county, Dr. Haggard was educated at the academy at Lebanon. Early in life he evinced an aptitude and desire to become a physician, which he cherished as his chief ambition. He was only eleven years of age when his father died, but, being the only son, he assisted his mother in the affairs of the farm and in educating his five sisters.

By teaching school and acting as tax assessor of his county, at the early age of nineteen he earned enough money to give himself a medical education. After the usual office reading for one year with a local physician, he attended his first course of lectures at the University of Louisville.

He graduated in 1851, with distinction, at the Jefferson Medical College, Philadelphia, the subject of his final thesis being "Enteromesenteric Fever."

He located in Gallatin, Tennessee, and soon established an

extensive practice. He performed all of the operations of the day and was noted as being conservative, yet progressive. He always kept abreast of his profession and made frequent journeys to the large medical centres.

His Kentucky rearing and relationships led him to take a neutral position in the war between the States, but he rendered most efficient medical and surgical aid to the armies of both sides, as well as to the women and children of Sumner and adjoining counties.

In 1875 he moved to Nashville, and became an assistant to the Chair of Gynecology in the Medical Department of the University of Nashville and Vanderbilt University, and was among the first to accentuate the value of clinical teaching in the South.

In 1884 he was chosen to fill the Chair of Gynecology and Diseases of Children in the University of Tennessee, which had been established some years earlier by Paul F. Eve and W. K. Bowling. It was in the teaching of his specialty that his enthusiasm and natural gifts found their full fruition.

As a teacher for nearly a quarter of a century he made a wholesome and ineffable impression upon the ambitions and practices of hundreds of young medical men throughout the South and West. He continued to fill his chair until his death. Higher standards of medical education found in him an early champion. The Southern Medical College Association selected him as the first President, and rapidly followed the example of the more wealthy colleges of the East in requiring a three and then a four years' graded course.

In 1887 he was the Chairman of the Section on Diseases of Children of the American Medical Association.

At that time he was one of the Attending Surgeons at the Nashville Hospital and was instrumental in organizing St. Margaret's Hospital, where he did most of his operating. At the initial meeting of the Alabama Surgical and Gynecological Association in 1887 he was among the few men who were present from out of the State. He urged the extension of the Alabama Association into the Southern, and was most earnest and active in launching the new organization, which was destined to become such a prominent and distinguished body. He was unanimously chosen the first President in recognition of his services and enthusiasm in the cause. He saw with prophetic vision and voiced his hopes in the following

words in his Presidential Address: "The most capable and ardent among us fall far short of realizing the grand possibilities which await us. . . . This Association did not spring voluntarily into existence, but was the outgrowth of necessity and is the embodiment of unknown power. It was the work of a few energetic minds and hearts that saw its need and seized the opportunity to give it form and being, which was accomplished in this city (Birmingham) the second Tuesday in September, 1887, at a most auspicious moment and under most favorable circumstances."

Dr. Haggard was a member of the Council continuously for the first ten years of the Association's existence, and used his utmost endeavor to shape its course and scope, to its present degree of eminence and importance.

He was also a member of the American Association of Obstetricians and Gynecologists, and an Honorary President of the Pan-American Medical Congress in 1893.

The Nashville Academy of Medicine honored him with its presidency in 1892.

He was the author of many articles upon gynecological and abdominal subjects. He was among the first to use and report continuous irrigation for generalized peritonitis and other septic processes. He early called attention to the part the shoulders play in producing laceration of the perineum, and formulated rules for its avoidance. His discussion of medical subjects was bold and forceful, yet courteous and convincing.

The feasibility of Cæsarean section, which he urged in lieu of craniotomy, while he never personally performed it upon the living subject, did much to draw attention to its utility and to discredit the destruction of the child.

The later years of his life were devoted largely to surgery and gynecology, but he always did a large general practice and possessed a wonderful capacity for continued and arduous work.

His only fear in life was of paralysis and a lingering death. He feared that his great physical vigor would postpone the end to a wearying length. He was spared this fear and rewarded with the sudden demise for which he wished, from cerebral hemorrhage, on January 25, 1901.

"For so He giveth His beloved sleep."

HUNTER HOLMES McGUIRE.

HUNTER HOLMES McGUIRE, M.D., LL.D.

PRESIDENT, 1889.

Hunter Holmes McGuire was born in Winchester, Virginia, October 11, 1835. He was the son of a physician, and hence early began the study of medicine. He graduated from the Winchester Medical College in 1855, and was almost immediately elected to the Chair of Anatomy in that school, which he occupied for several years.

In 1858, feeling the need of greater professional opportunities, he went to Philadelphia, where, together with Dr. Luckett and Dr. Pancoast, he organized a quiz class. This was largely attended by the students both of the University of Pennsylvania and the Jefferson Medical College. In 1859 John Brown was executed and his body taken to Philadelphia. This created bitter sectional feeling, and the Southern medical students in Philadelphia determined to return South. Dr. McGuire acted as their leader, and despite all obstacles brought three hundred of them to Richmond, where they were received with great demonstrations, Governor Henry A. Wise welcoming them in a stirring speech, the city of Richmond refunding money which had been expended in railroad fares, and the Medical College of Virginia matriculating them as students without charge. Dr. McGuire remained in Richmond until the completion of the session, receiving for the second time the degree of M.D. In March he went to New Orleans and established another quiz class in connection with the Medical Department of the University of Louisiana, now Tulane University. Early in 1861, foreseeing that war between the States was inevitable, he returned to his home in Virginia.

Dr. McGuire volunteered as a private in Company F, 2d Virginia Regiment, and on April 1, 1861, marched from Winchester to Harper's Ferry. Soon afterward he was commissioned as a Surgeon, and in May, 1861, he was made Medical

Director of the Army of the Shenandoah, then under the command of General T. J. Jackson. Later, when General Jackson organized the First Virginia Brigade—the future Stonewall Brigade—Dr. McGuire was assigned to it as Brigade Surgeon. He served as Chief Surgeon of Jackson's command until the death of that great soldier, amputating his arm and having personal charge of his case during his last illness. Dr. McGuire then served as Chief Surgeon to the Second Corps under command of Lieutenant-General Ewell, and later became Medical Director of the Army of Northern Virginia. Finally he was appointed Medical Director of the Army of the Valley of Virginia under Lieutenant-General Jubal A. Early, and served in this capacity until the surrender at Appomattox. Dr. McGuire was held in confidence and esteem by all with whom he served, and was on one occasion presented by General Jackson with a sword on the field of battle as a reward for conspicuous service. He was the first to organize the Reserve Corps Hospital; he perfected and systematized the ambulance service, and inaugurated the system of exchange of medical officers captured by the two armies. When he himself was captured in the disaster to the Confederate troops at Winchester he was promptly paroled by special order from General Sheridan.

After the war Dr. McGuire married a daughter of the Hon. A. H. H. Stuart, of Staunton, Virginia, and located in Richmond, where he was shortly elected to the Chair of Surgery in the Medical College of Virginia left vacant by the death of Dr. Charles Bell Gibson. He filled this position for thirteen years, and then resigned it owing to the demands of his growing practice. He was elected Emeritus Professor of Surgery by the Board of Visitors in 1880.

In 1893, realizing the need for a high-grade medical school in the South, Dr. McGuire was the leader in the movement which resulted in the establishment of the University College of Medicine. He was elected President of the Corporation and Professor of Clinical Surgery of the Faculty, both of which positions he filled to the time of his last sickness. The college was a success from its inauguration, and will remain as a perpetual monument to his enterprise and judgment.

Dr. McGuire had a large part in the establishment of almost all the hospitals which exist in Richmond. He helped to reorganize the College Infirmary connected with the Medical College of Virginia. He was the prime mover in the establish-

ment of the Retreat for the Sick, which is still in existence and doing a worthy work. He was the first contributor to the Sheltering Arms Hospital, which is conducted by the King's Daughters, and is at present the only absolutely free hospital in the city. He was the Founder and first President of the Virginia Hospital, which is affiliated with the University College of Medicine and is its school for clinical teaching. He established St. Luke's Hospital, which is now conducted as a private sanatorium by his eldest son.

Dr. McGuire was a member of many medical associations and received many professional honors. He was President of the American Medical Association, of the American Surgical Association, of the Southern Surgical and Gynecological Association, of the Association of Medical Officers of the Confederate Army and Navy, of the Medical Society of Virginia, of the Richmond Academy of Medicine and Surgery. He was Honorary Member of the Medical Society of Virginia, West Virginia, North Carolina, Texas, etc. He received many other degrees. The degree of LL.D. was conferred on him by the University of North Carolina in 1887, and the Jefferson Medical College of Philadelphia honored him a year later with the same title. Dr. McGuire was the author of no book on surgery, but his contributions to various Systems and Encyclopedias and articles published at frequent intervals in various medical journals are too numerous to be mentioned.

Dr. McGuire's death occurred September 19, 1900, six months after an attack of paralysis, due to cerebral embolism. The press at the time was filled with testimonials to his personal character and professional work, a fair specimen being the following from the *New York Medical Record:* "For a long period he maintained the proud position of the leading surgeon of the South, and his loss to the profession and his numerous friends and admirers is irreparable. Identified with all matters tending to the advancement of the interests of his calling, a writer of authority, and a leading and distinguished educator, he exerted an influence for good along many and varied lines, which can scarcely be overestimated. His voluminous and varied writings on surgical subjects proved him a thorough scholar, a skilled anatomist, and a judicious and conservative counsellor. As an occasional contributor to general periodical literature he took high rank, which was well deserved after his admirable and touching history of the death wounds of Stone-

wall Jackson. He was a hard and constant worker, but his main ambition centred in the foundation and prosperity of the University College of Medicine of Richmond, with which he was so long and honorably identified."

A still greater evidence of the love and affection in which he was held by his numerous friends and patients is the fact that without solicitation a fund has been raised for the erection of a bronze statue of heroic size to his memory and that the Legislature of Virginia has recently passed a bill authorizing its location in the Capitol Square in close proximity to that of his beloved leader Stonewall Jackson. The sculptor has been chosen, his model has been approved, and the statue will probably be unveiled in the fall of 1903.

BEDFORD BROWN,

PRESIDENT, 1893.

(Memorial, in Transactions, 1898.)

ROBERT BATTEY

ROBERT BATTEY, M.D.

Robert Battey, of Rome, Georgia, was born in Richmond County, Georgia, November 26, 1828. He was a son of Cephas Battey, a native of Clinton County, New York, and Mary A., daughter of George McGruder, of Richmond County, Georgia. His ancestors, who were English, settled at Providence, Rhode Island.

He was educated at Augusta, Georgia, and at Phillips Academy, Andover, Massachusetts, and studied medicine at Booth's laboratory, Philadelphia, the Philadelphia College of Pharmacy, the University of Pennsylvania, and Jefferson Medical College, graduating from the Philadelphia College of Pharmacy, March 17, 1856, and from Jefferson Medical College, March 7, 1857.

He resided in Rome, Georgia, from December, 1847, to the time of his death, 1895, excepting the interval from November, 1872, to October, 1875, during which he resided temporarily at Atlanta, Georgia, as Professor of Obstetrics in the Atlanta Medical College, and editor of the *Atlanta Medical and Surgical Journal.* He originated and successfully performed, in August, 1872, an operation which made him famous, since known as Battey's operation, for the removal of the ovaries, with a view to effect the change of life in women, and thereby effectually remedy certain otherwise incurable maladies. The removal of the uterine appendages was done about simultaneously by Battey in America, Tait in England, and Shroeder in Germany.

He devised and used successfully, in 1859, an improved apparatus for vesicovaginal fistula; and in 1872 he discovered that water, introduced by the rectum, may be readily passed in the living body, the patient being etherized, throughout the colon, the small intestines and stomach, coming out of the mouth, and he has repeatedly so passed it, as others after him have done, the entire practicability of doing it having been

demonstrated upon the cadaver, at the Atlanta Medical College, in December, 1873, in the presence of the Professor of Anatomy, Dr. Johnson, and his class.

On June 3, 1869, he performed successfully the operation of perineal section (suggested by Professor Willard Parker, of New York) for chronic cystitis, in a man aged sixty-two years. In April, 1874, he successfully performed vaginal ovariotomy, being the third instance of the operation. In November, 1876, he removed from a man, aged forty-three years, a fibrocystic tumor of the carotid region, weighing four and one-half pounds, the patient making a good recovery in fourteen days.

He devised in 1858, and often practised, a new method of treating club-foot, by the use of carved wooden splints and roller bandage. He was a member of the Georgia Medical Association, of which he was elected President in 1876, and of whose Board of Censors he was Chairman from 1873; the Atlanta Academy of Medicine. He was one of the founders of the American Gynecological Society, Vice-President in 1886, President in 1888, and Honorary Fellow after 1892. His contributions to the literature have been numerous and important.

In July, 1861, he was commissioned a surgeon in the Confederate Army, serving as Surgeon of the 19th Georgia Volunteers; as Senior Surgeon of Hampton's Brigade; as Senior Surgeon of Archer's Brigade; as Surgeon-in-charge of the Fair Ground Hospital, No. 2, at Atlanta, Georgia; as Surgeon-in-charge of Polk Hospital, at Rome, Atlanta, and Vineville, Georgia, and at Lauderdale, Mississippi, and subsequently at Macon, Georgia, until the close of the war.

He was Professor of Obstetrics in the Atlanta Medical College from 1873 to 1875, and from 1873 to 1876 editor of the *Atlanta Medical and Surgical Journal.* He was married, December 20, 1849, to Martha B. Smith, at Rome, Georgia, who bore him fourteen children, of whom nine are living. He died in 1895.

It is difficult to estimate the value of Battey's work. While the limitations for removal of the appendages has been very much abridged, and restricted to wholly irremediable and actual inflammatory processes, still the feasibility of the removal of the ovaries per vaginam was first demonstrated by Battey, and now finds confirmation at the hands of many operators who do varied procedures on the adnexæ above the

vagina. Moreover, it must be admitted that while the indications for Battey's operation have been greatly revised, still his original work coupled with Tait's did much to popularize abdominal section for the cure of the pelvic inflammatory diseases. It was upon Battey's suggestion of removal of normal ovaries that these operations became popularized, and their frequent performance led to a truer knowledge of the physiology and pathology of these important functional structures, as well as to the extension of surgical procedures to other organs in the abdomen. The advent of asepsis, in conjunction with the early experiences gained in Battey's operation, laid the foundation for the present perfected status of the surgery of the abdomen and for the conservative work that is now being added as the capstone to the structure of pelvic surgery.

Battey's name should be coupled with that of McDowell and Sims in reciting the epoch-marking contributions to the surgery of women, and in estimating the immortality of the contributions of the surgery of the South.

DAVID W. YANDELL.

DAVID W. YANDELL, M.D., LL.D.

David Wendell Yandell was born on September 4, 1826, at Craggy Bluff, his father's country home, six miles from Murfreesboro, Tennessee. The ancestors of the Yandells came from England and settled in South Carolina.

His grandfather, Dr. Wilson Yandell, was a noted physician of his locality and time. His father was the eminent Dr. Lunsford Pitts Yandell of blessed memory. His mother was Susan Juliet Wendell, of Murfreesboro.

Dr. Yandell was educated in public and private schools in Lexington and Louisville, Kentucky. He graduated from the University of Louisville in 1846, and soon after went to Europe, where he studied medicine in the schools and hospitals of London, Dublin, and Paris. His letters written at that time, on medical and popular topics, attracted unusual attention.

On his return from Europe he was appointed Demonstrator of Anatomy in the University of Louisville. In this office he acquired an intimate knowledge of the human body and that deftness of hand which in time made him *facile princeps* in surgery.

In 1851 his health gave way, and, buying a farm near Nashville, Tennessee, he devoted two years to the pursuit of agriculture. Returning to Louisville he practised and taught medicine until the outbreak of the Civil War. He cast his lot with the Southern cause, taking at once a prominent position as surgeon under General Buckner. Soon after he was made Medical Director of the Department of the West under General Albert Sydney Johnston. At the close of the war he returned to Louisville, where he lived, practised, and taught medicine and surgery for more than thirty years.

Dr. Yandell established the Stokes Dispensary, which was the first clinical institution west of the Alleghenies. In 1867 he was elected to the Chair of the Science and Practice of Medicine in the University. In 1869 he was made Professor of

Clinical Surgery in this school, a position which he held to the end of his life. He founded and conducted for many years the *American Practitioner*, one of the most classically edited and best-known periodicals of the country. In 1871 he was elected President of the American Medical Association. In 1883 he was unanimously elected Honorary Fellow of the Medical Society of London, and in 1884 he was made Corresponding Member of the Edinburgh Medico-Chirurgical Society. He died May 2, 1898.

He was a physician, a surgeon, a writer, a soldier, an orator, a sage, and a philanthropist. His State, his city can boast no greater name, nor do the annals of American medicine present a more vigorous, original, and versatile figure.

WILLIAM THOMPSON BRIGGS.

WILLIAM THOMPSON BRIGGS, M.D.

William Thompson Briggs, Nashville, Tennessee. Born December 4, 1829, at Bowling Green, Kentucky, died June 13, 1894, was the son of Dr. John McPherson and Harriet (Morehead) Briggs. Dr. William T. Briggs received a literary education in the colleges of Bowling Green and Lexington, Kentucky, commenced the study of medicine in 1847, with his father, attended two courses of lectures at the Medical Department of Transylvania University, from which he graduated in 1850. He also attended several partial postgraduate courses. Dr. Briggs practised medicine with his father at Bowling Green after graduation until elected to the position of Demonstrator of Anatomy in the Medical Department of the University of Nashville, in 1851, when he removed to Nashville, Tennessee, and soon after formed a partnership with Dr. John M. Watson, Professor of Obstetrics in the University, which partnership continued until the death of Dr. Watson in 1866. Dr. Briggs was made Adjunct Professor of Anatomy with Dr. Thomas R. Jennings, Professor of Anatomy in the University of Nashville, and at the close of the war took the Chair of Surgical Anatomy and Physiology, which he held until 1866, when he was transferred to the Chair of Obstetrics and Diseases of Women and Children, made vacant by the death of Dr. Watson. In 1868 he was made Professor of Surgery in the same University, and he held the same position in the consolidated Medical Departments of the University of Nashville and Vanderbilt University at the time of his death.

Dr. Briggs was a member of the Medical Society of the State of Tennessee, of which he was at one time President; Mississippi Valley Medical Association, American Medical Association, of which he was President in 1890, its delegate to the International Medical Congress at London, England, 1881, and a member of its Judicial Council at the time of his death; one of the Founders of the American Surgical Association, and its

President in 1885; member of the Southern Surgical and Gynecological Association; President of the Section of General Surgery in the International Medical Congress, Washington, D. C., 1887; Staff Surgeon to the Nashville City Hospital, and in 1893 was delegated and was one of the Vice-Presidents of the International Medical Congress, Rome.

Dr. Briggs' most notable surgical operations have been: ligation of the internal carotid artery for traumatic aneurism, 1871; removal of both entire upper jaws for gunshot injury, 1863; removal of lower jaw for gunshot wound, 1863; hip-joint amputation for elephantiasis arabum, leg weighing eighty pounds, 1875.

His study at the Medical Department of the Transylvania University under Dudley, who at that time was noted as a brilliant surgeon and lithotomist, led him to take great interest in surgery, and his appointment to the position of Demontsrator in Anatomy in the Medical Department of the University of Nashville, Tennessee, in 1851, then beginning its first session, gave him an opportunity to pursue his studies in anatomy and to practice the graver operations of surgery on the cadaver, thus fitting him thoroughly for the career of surgeon. This position he filled, later also the position of Adjunct Professor of Anatomy until 1865, when he filled the Chair of Surgical Anatomy and Physiology.

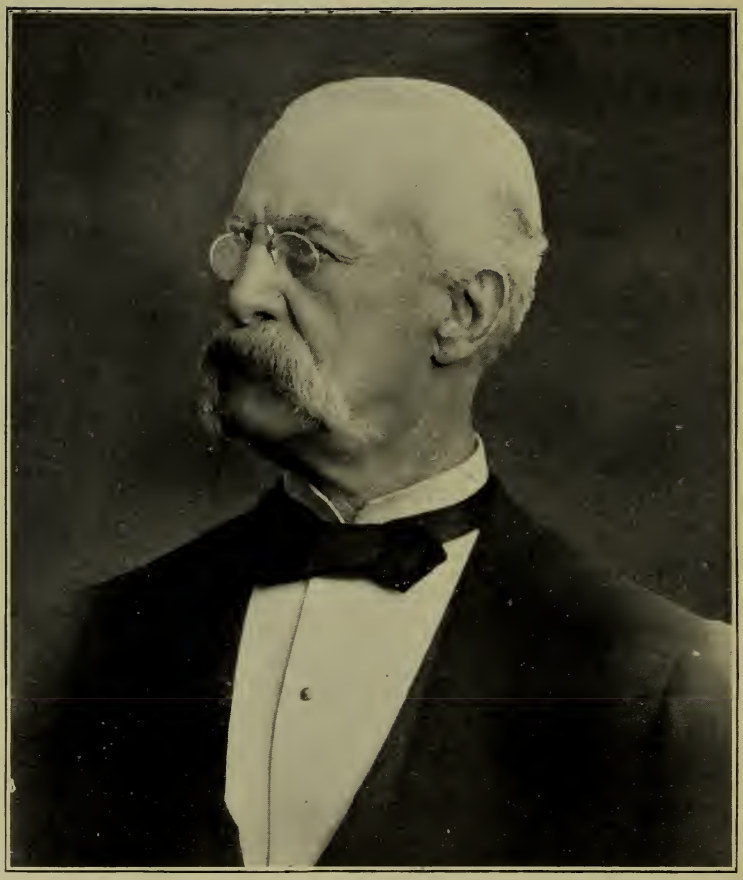
As a result of these studies he devised a method of operation in lithotomy—the medio-bilateral method—only to find that this same method had been devised and practised by Civiale and had fallen into disuse. This method was his choice, and was performed by him with remarkable success. In his trephining operations he was remarkably successful, due no doubt to his careful selection of cases. His success in operation for tumors was due to the same care. His care in the preparation of patients for operation was the result of his studies under Dudley.

His more important publications are as follows: "History of Surgery in Middle Tennessee," "Tetanus Treated by Chloroform," *Nashville Journal of Medicine and Surgery,* 1851; "Enchondromatous Tumors of the Hand, Forearm, and Arm," "Successful Amputation at the Shoulder-joint," *ibid.*, 1871; "Traumatic Aneurism of the Internal Carotid, the Result of a Puncture, Ligation of the Common Carotid and then of the Internal at the Seat of Injury," *ibid.;* "Escape of Catheter into

the Bladder during its Use for the Relief of Retention," *ibid.*, 1871; "Unilocular Ovarian Tumor, Operation, Recovery," *ibid.*, October, 1876; "Dislocation of the Radius and Ulna Backward in a Patient Two and One-half Years Old," *ibid.*, 1871; "Multilocular Ovarian Tumor—Tapped More than Fifty Times; Extensive Parietal, Intestinal, and Vesical Adhesion; Incision Eight Inches Long, Weight of Tumor Eighty-five Pounds, Recovery," *ibid.*, May, 1872; "Trephining in Epilepsy," *ibid.*, 1869; "Dugas' Pathognomonic Symptom in Dislocation at Shoulder-joint," *ibid.*, 1875; "The Trephine, Its Uses in Injuries of the Head," *ibid.*, 1876; "The Antiseptic Treatment of Wounds after Operations and Injuries," a paper read before the Surgical Association in 1881—a pamphlet. "The Surgical Treatment of Epilepsy," read before the American Surgical Association, June 1, 1884—a pamphlet.

Dr. Briggs had performed the operation for stone two hundred and fifty-four times, with but six deaths; of trephining seventy-five times, with five deaths; removed over three hundred ovarian tumors and ligated all the principal arteries. During the war Dr. Briggs declined all civil offices and medical commissions, although attending the hospitals, Federal and Confederate alike, for humanity's sake. In 1850 he became a Master Mason at Bowling Green.

Dr. Briggs married, May 25, 1851, Miss Annie E. Stubbins, of Bowling Green, daughter of Samuel and Hettie (Garrison) Stubbins. She died May 6, 1894. Their four children are Charles S. Briggs, M.D., formerly Professor of Surgical Anatomy and Operative Surgery, Medical Department of the University of Nashville and Vanderbilt University; Waldo Briggs, M.D., Professor of Surgical Anatomy and Operative Surgery, College of Physicians and Surgeons, St. Louis; Miss Virginia Lee Briggs; and Samuel S. Briggs, M.D., formerly Demonstrator of Anatomy in the Medical Department of the University of Nashville and Vanderbilt University.



CLAUDIUS HENRY MASTIN

CLAUDIUS HENRY MASTIN, M.D.

Claudius Henry Mastin was of English descent, and was born in Huntsville, Alabama, on June 4, 1826, and died October 3, 1898. He received a classical education at the University of Virginia.

In 1846 he commenced the study of medicine in the office of Dr. John Bassett, a distinguished physician of Huntsville, under whose tutelage he remained for eighteen months. He then went to Philadelphia as a private pupil of the late distinguished Dr. George B. Wood.

In 1849 he received the degree of Medicine from the University of Pennsylvania. In the following year he went abroad, pursuing his studies in the University of Edinburgh, the Royal College of Physicians and Surgeons of London, and the University of France.

He located in Mobile, Alabama, in 1854, where he spent the remainder of his life in the practice of his profession.

At the outbreak of the Civil War, in 1861, he was commissioned Surgeon in the Confederate Army, and served as Medical Director on the Staff of General Leonidas Polk, who commanded the First Division of the Western Department. Later he occupied the position of Medical Inspector under Generals Braxton Bragg and G. T. Beauregard respectively.

He was Surgeon of the Mobile City Hospital in 1855, to the Providence Infirmary in 1877 to 1879, and Assistant Surgeon in the United States Marine Hospital Service at Mobile from 1854 to 1857. He was the organizer of the first Congress of American Physicians and Surgeons, which met in 1886, and was a Member of its Executive Committee from 1886 to 1893, and was First Vice-President of the Congress in 1890 and 1891. He was an Original Fellow of this Association, the Second Vice-President in 1883 and 1884, First Vice-President in 1889 and 1890, President in 1890 and 1891, and a member of the Council from 1891 to 1896. He was one of the organizers of

the American Genito-Urinary Association and President of that body in 1895 and 1896. He was a member of the Southern Surgical and Gynecological Association, also of the Boston Gynecological Association. He was one of the Trustees of the Pan-American Congress in 1891. He was an Honorary Member of the Historical Society of Texas; Vice-President of the Alumni Association of the University of Pennsylvania from 1892; Member of the Central Committee of the University of Pennsylvania from 1882, and Medical Examiner for that institution for the Southern States from 1881. In 1874 he delivered the first alumni address before the Alumni Association of the Medical Department of the University of Pennsylvania, and in 1875 was honored with the degree of LL.D. by that institution. He was a Member of the International Medical Congress of 1876, at Philadelphia, and presented a paper before that body on the "Geographical Distribution of Stone."

He was the originator of the Gross monument in this city, and it was through his untiring personal efforts, representing the American Surgical Association, together with the co-operation of the Alumni Association of the Jefferson Medical College, that the fund for that purpose was secured. He was one of the orators at the dedication of the Agnew Memorial Pavilion of the Hospital of the University of Pennsylvania in 1897.

His literary work consisted largely of contributions to the medical press, especially on genito-urinary subjects, together with essays and addresses, including "The Reminiscences of a Medical Student," which was published in the *Birmingham Medical Journal.*

He was a brilliant operator, being noted throughout the South for his dexterity with the knife. He performed all the major surgical operations. He was, however, a conservative surgeon, and was most painstaking in his technique.

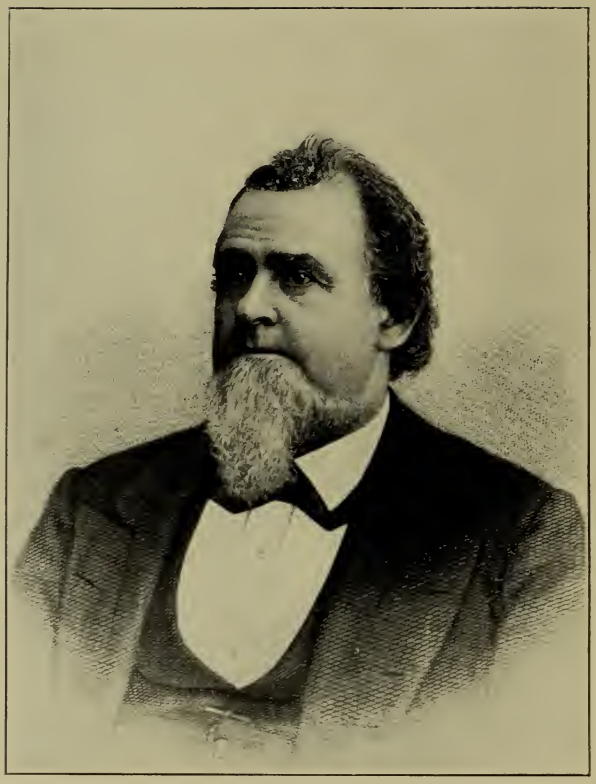
He recognized early the necessity for cleanliness in surgery upon which, together with accurate coaptation of wounds, avoiding dead spaces, he laid much stress long before the publications of Lister. He was an early advocate of metallic ligatures and sutures, and employed silver wire successfully for the deligation of the iliac artery for aneurism, early in the 60's. He also employed the silver-pin suture for vesicovaginal fistula about the same time.

On September 20, 1848, he was united in marriage to Mary

E. McDowell, a relative of the "Father of Ovariotomy," and from this union two sons and two daughters resulted.

He was a man of varied attainments, of broad reading, a facile letter-writer, and a finished scholar. It will be long before those of us who had the opportunity of listening to his eloquent and touching address at the unveiling of the Gross monument, three years ago, shall forget its beauty and pathos. At times it seemed as though his emotions would overcome him, as he described in classic periods the character of his departed friend. Through it all shone that warmth of feeling and kindness of heart which characterized his life.

In his death this Association has suffered the loss of one of its ablest and most distinguished Fellows and the profession of the South its Nestor in surgery.—*From the Transactions of the American Surgical Association.*



HENRY F. CAMPBELL.

HENRY FRASER CAMPBELL, M.D.

Henry Fraser Campbell, of Augusta, Ga., son of James C. and Mary R. Campbell, the former of Irish, the latter of American birth, was born in Savannah, Ga., February 10, 1824. Having received an academic education, supplemented by a classical course under a private tutor, he entered the Medical College of Georgia, now the Medical Department of the University of Georgia, and was graduated thence M.D. in March, 1842.

In the same year he established himself in Augusta, where, save during the late war and during the winter of 1866-67, 1867-68, he had remained.

Of his notable cases may be mentioned: forty-four of lithotomy, forty-two successful, and fifteen of gangrenous inflammation arrested by ligation of the main artery, the first ligation June 5, 1862. The sliding-hook forceps, for vesicovaginal fistula, and the pneumatic repositor for self-replacement of the uterus, are instruments of his invention.

From 1842 to 1854 he was Demonstrator and Assistant Demonstrator of Anatomy; from 1854 to 1857 he was Professor of Comparative and Microscopic Anatomy, and from 1868 to the time of his death, Professor of Operative Surgery and Gynecology in the Medical Department of the University of Georgia. During this period he was Clinical Lecturer in Jackson Street Hospital, the City Hospital, and Freeman's Hospital of Augusta.

In the winter of 1866-67 he was Professor of Anatomy, and in the winter of 1867-68 Professor of Medicine in the New Orleans School of Medicine, and Clinical Lecturer in Charity Hospital; and in the winter of 1868-69 was Professor of Operative Surgery in the Medical College of Georgia.

He was a member of the American Medical Association, Vice-President in 1858; of the Georgia Medical Association, President in 1871; a correspondent of the Academy of Natural Sciences of Philadelphia, elected in 1858; a Corresponding

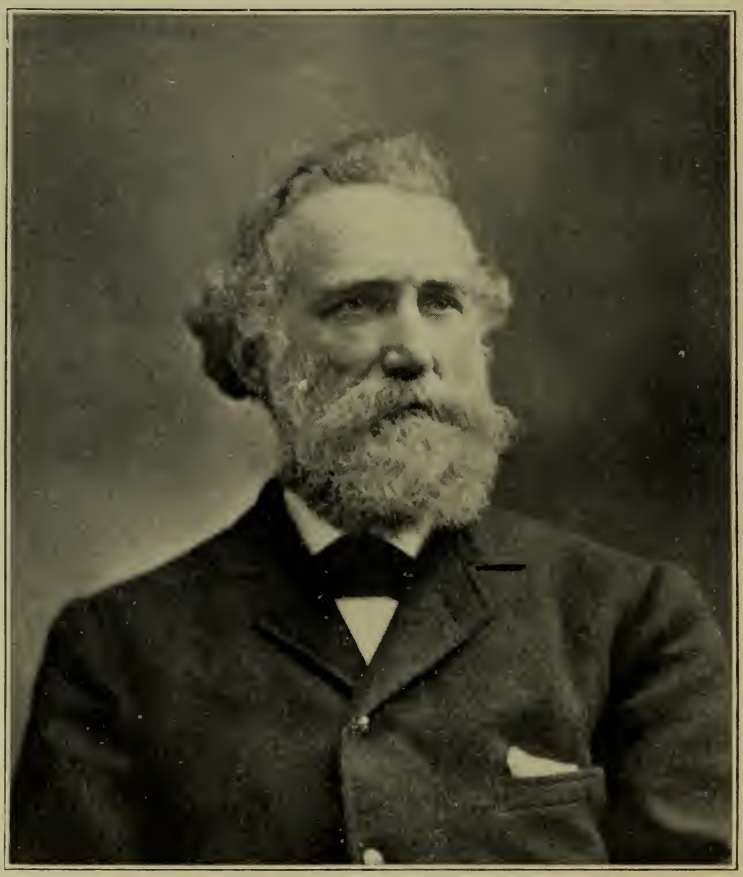
Member of the Imperial Academy of Medicine of St. Petersburg, Russia, elected in May, 1860; a Fellow and one of the Founders of the American Gynecological Society, in 1876; a Member of the Georgia State Board of Health, elected in 1875, and was President of the Augusta Library and Medical Society, elected in 1877.

The following may be named as among his more important professional publications: "Bilateral Lithotomy," August, 1851; "The Sympathetic Nerve in Reflex Phenomena, a Question of Priority of Announcement, with M. Claude Bernard," etc., May, 1853; "Strangulated Ventral Hernia during Pregnancy," *Southern Medical and Surgical Journal*, January and March, 1857; "The Excito-secretory System of Nerves," etc., prize essay, *Transactions of the American Medical Association*, May, 1857; "Meckel's Ganglion," etc., *Southern Medical and Surgical Journal*, February, 1858; *The Secretory and the Excito-secretory System*, Lippincott, Philadelphia, 1858; "A New 'Ready Method,' Artificial Respiration in the Sitting Posture," May, 1860; "Traumatic Hemorrhage and the Arteries," etc., a chapter in the *Confederate Manual of Military Surgery*, Richmond, 1863 (the Principle of Ligating the Main Arterial Trunk of a Limb, for the Cure of Inflammation, and for Gangrene, is announced in this chapter); "Position, Pneumatic Pressure, and Mechanical Appliance in Uterine Displacements," pamphlet, Augusta, 1875, *Atlanta Medical and Surgical Journal*, June, 1875; "Blood-letting in Puerperal Eclampsia," etc., *American Journal of Obstetrics and Diseases of Women and Children*, August, 1876; "Railroad Transportation of Disease Germs," etc. (Yellow and Dengue Fever in the South, in 1839, 1850, 1854, and 1876), *Annual Report, Board of Health of Georgia*, 1876; "Pneumatic Self-replacement in Dislocations of the Gravid and Non-gravid Uterus," *American Gynecological Transactions*, 1876; "Calculi in the Bladder after the Cure of Vesicovaginal Fistula," *ibid.*, 1876; "The Neuro-dynamic Etiology and Pathology of Urinary Calculus," and "Arterial Ligation in the Treatment of Traumatic Inflammation and Gangrene," read before the Surgical Section of the International Medical Congress in 1876.

In this list should be included his discussion with Dr. Marshall Hall, of London, touching "Priority of Announcement in Reflex Secretion and the Excito-secretory System of Nerves," a digest and review of which will be found in the

Southern Medical and Surgical Journal, 1857, in the London *Lancet*, May 2, 1857, in the *American Journal of the Medical Sciences*, 1857-58, and in the *Nashville Journal of Medicine and Surgery*, 1858. Dr. Marshall Hall's adjudication candidly awarded the claim of priority to Dr. Campbell, as will be found in the London *Lancet*, May 2, 1857. From 1857 to 1861, in conjunction with his brother, Dr. Robert Campbell, he was editor of the *Southern Medical and Surgical Journal*, published at Augusta, Ga. In 1861 he was commissioned a Surgeon in the Confederate States Army; was assigned as Medical Director of the Georgia Military Hospital, at Richmond, Va., and in this capacity—being at the same time a member of the Army Board of Medical Examiners—served until the end of the war.

He married June 17, 1844, Sarah Bosworth, daughter of Amory Sibley, Esq., of Augusta. His death occurred in 1891.



ROBERT ALEXANDER KINLOCH.

ROBERT ALEXANDER KINLOCH, M.D.

Dr. Robert Alexander Kinloch was born in the city of Charleston, South Carolina, on the 20th day of February, 1826. He was educated at the College of Charleston, South Carolina, from which institution he was graduated with distinction in 1845. Immediately after leaving college he began the study of medicine in the Medical College of the State of South Carolina, and attended one course of lectures there, after which he went to Philadelphia and entered the University of Pennsylvania, from which he received the degree in medicine at the commencement exercises of 1848. Subsequently he went abroad and attended lectures and hospital service in London, Paris, and Edinburgh. After two years' residence in Europe he then returned to America and commenced the practice of his profession in the city of his birth.

At the outbreak of the Civil War he entered the military service with the rank of Surgeon, and served with great distinction to its close as Medical Director on the staffs of Generals Lee, Pemberton, and Beauregard. His last position was that of General Medical Inspector of Hospitals.

After the close of the war he returned to Charleston and resumed the practice of his profession. In 1867 he was elected Professor of Materia Medica and Therapeutics in the Medical College of the State of South Carolina, and a short time afterward he was transferred to the Chair of Surgery in the same institution, which position he held at the time of his death. He was, for a long time, Surgeon to St. Xavier's Infirmary; to the Roper and City Hospitals of Charleston; a member, and at one time the president, of the Medical Society of South Carolina; President of the Medical Association of South Carolina; an Associate Fellow of the College of Physicians of Philadelphia, and a delegate from his State Association to the International Medical Congress of 1876. He was the First Vice-President of the American Medical Association in 1883, and a delegate from this Association to the Berlin Congress of 1890.

His connection with the American Surgical Association is of especial interest, as he was one of its original Fellows, and from its first to its last session he proved himself an active and energetic worker in its behalf.

As editor of the *Charleston Medical Journal* he did much work, and his contributions to surgical literature are to be found scattered through its pages as well as others of the medical press. Although not what might be termed an extensive writer, his articles were sound and practical. He was by far the most prominent surgeon in his section of the South, and some of his operations were unique. He was the first surgeon in America who successfully made a resection of the knee-joint for chronic disease of that joint; the first to treat fracture of the lower jaw by wiring the fragments; and to him belongs the honor of being the first surgeon who ever performed laparotomy for a gunshot wound of the abdomen without protrusion of the viscera.

It was, however, in his private and his social relations that the character of the man was most marked, and the universal esteem in which he was held by the community in which he resided from his birth to his death attests his worth. Apparently of a cold and reserved nature, he was yet the most genial of men, and those who knew him best found in his bosom as warm and kindly a heart as ever beat responsive in sympathy for his fellow-men.

Although not unexpected—for he had been dangerously ill for several days—on December 23, 1891, when the news went forth that Robert A. Kinloch was dead, all Charleston mourned. His loss was felt to be a sad and irreparable one to the community in which he had resided, and the entire South knew that one of her best citizens, one of her truest men, had passed away.

He is a loss to the American Surgical Association, and those who enjoyed his friendship will long remember him as the skilful surgeon, the chivalric gentleman, the true, tried, and trusted friend.—*From the Transactions of the American Surgical Association.*

ALBERT B. MILES.

ALBERT B. MILES, M.D.

The career of Dr. A. B. Miles was a most interesting one. Coming to New Orleans, almost a stranger, by his perseverance, intelligence, and devotion to duty, he earned his way to the highest and most coveted position in the medical profession of the State of Louisiana—Chief House Surgeon of the Charity Hospital of New Orleans.

Dr. Miles was born in Prattville, Alabama, May 18, 1852, and died August 5, 1894. When he was five years old, his family moved to El Dorado, Arkansas, where his father engaged in farming. His early education was obtained in that town. His father died in 1864 and his mother in 1865, and the care of the boy devolved upon his maternal uncle, who fulfilled his trust well. At sixteen young Miles entered the Gordon Institute, Arkansas, and two years later entered the University of Virginia, where he remained two years. In 1872 he came to New Orleans and began the study of medicine, his uncle's profession. He matriculated in 1872–73, and was appointed a resident student at the Charity Hospital. His preceptor was Dr. Samuel Logan. It was largely due to this famous surgeon's influence and friendship that Dr. Miles began his career so auspiciously. Dr. Miles served two years in the hospital. He graduated March 16, 1875, being the valedictorian of his class. He chose New Orleans for his home. Two months after graduation he was made Demonstrator of Anatomy in the Medical Department of the University of Louisiana (now Tulane University), which position he held ten years, during which time he was Chief of Clinic for Prof. Samuel Logan. In April, 1876, he became one of the Visiting Surgeons of the Charity Hospital, and one year later was appointed Assistant House Surgeon, which position he occupied for four years and three months. In 1880 he was made Acting Surgeon of the Hotel Dieu during the illness of Dr. P. C. Boyer. On the death of the latter, Dr. Miles became his successor as Surgeon of the Hotel Dieu. On

June 22, 1882, he was elected House Surgeon of the Charity Hospital, which position he held until his death.

Dr. Miles' hospital record may be summarized thus: Student from 1872 to 1875; Demonstrator of Anatomy, 1875 to 1885; Acting Physician Hotel Dieu, 1880 to 1881; Physician in Charge Hotel Dieu, 1881-82; Consulting Physician, 1882 to 1894; Resident Student Charity Hospital, 1873 to 1875; Visiting Physician, 1876 to 1877; Assistant House Surgeon, 1877 to 1881; House Surgeon, 1882 to 1894.

In 1886 Dr. Miles became Professor of Materia Medica and Therapeutics in the Medical Department of Tulane University. He succeeded Dr. Samuel Logan as Professor of Surgery on the death of the latter, in 1893, and discharged both duties with exceptional ability.

Dr. Miles' interest in affairs touching the profession was always active. He played a prominent part in medical organization. He was a member of the old New Orleans Medical and Surgical Association, one of the founders of the Orleans Parish Medical Society, and member of the Louisiana State Medical Society, the American Medical Association, and the Southern Surgical and Gynecological Association. He was President of the Louisiana State Medical Society in 1893-94, and it was during his administration that the Medical Practice Bill was passed by the Louisiana Legislature. He was a prolific contributor to medical literature, his articles being scattered among a large number of publications. He left no published systematic works on surgery, being called to the Great Beyond at the most brilliant time in his career.

JAMES THOMAS JELKS.

JAMES THOMAS JELKS, M.D.

FOUNDER.

James Thomas Jelks, Hot Springs, Arkansas, son of Joseph William Dawsey and Jane Goodrum (Frazer) Jelks, grandson of Robert Jelks, was born May 20, 1849, at Uchee, Russell County, Alabama. He was educated in the common and high schools of Union Springs, Alabama; commenced the study of medicine in 1868, at Union Springs, under Dr. Charles H. Franklin, of that place, and Dr. J. E. Cook, of Culloden, Georgia. He attended two courses of lectures at the Medical Department of the University of Nashville, Nashville, Tennessee, and was graduated in 1870. He commenced the practice of medicine the same year at Culloden, Georgia; lived in Marietta, Georgia, 1871-73; St. Louis, Missouri, 1874-77; and at Hot Springs, Arkansas, since the autumn of 1877.

Dr. Jelks was formerly a member of the Medical Society of Georgia; member of the Hot Springs Medical Society; of the State Medical Society of Arkansas, President in 1892; of the American Medical Association, Secretary of the Section on Obstetrics and Gynecology for sessions held at Cleveland, Ohio, Washington, D. C., and New Orleans, Louisiana, and Chairman of the Section on Surgery and Anatomy, 1892-93; Member of the Mississippi Valley Medical Society; of the American Association of Obstetricians and Gynecologists; of the Chicago Medical Society, and of the National Association of Railway Surgeons. He was Professor of Genito-urinary Surgery and Venereal Diseases, College of Physicians and Surgeons of Chicago, 1883-90; was Professor of Gynecology and Syphilology, Barnes Medical College, St. Louis, Missouri, since 1892, and was Consulting Surgeon Missouri Pacific and Iron Mountain Railroad.

In literary work, Dr. Jelks edited the *Hot Springs Medical Journal* and wrote upon "Antiquity of Syphilis." *Journal*

of the American Medical Association, 1893; "Gunshot Wound of Liver," *ibid.*, 1892; "Comparative Value of Mercury and the Iodides in the Treatment of Syphilis," *ibid.*, 1890; "Prevention of Venereal Diseases," *Transactions of the State Medical Society of Arkansas*, 1892; "Carcinoma of the Uterus: Hysterectomy," *ibid.*, 1893; "Medicinal Treatment of Peritonitis;" "Etiology and Treatment of Pneumonia;" "Medical Education," *Arkansas Medical Journal*, 1891-92; "Two Cases of Second Infection with Syphilis," read before the Hot Springs Medical Society; "Second Infection with Syphilis," *Hot Springs Medical Journal;* "Blennorrhœa," *Transactions of the Mississippi Valley Medical Society ;* "Medical Education," *Arkansas Medical Journal;* "Some Effects of Blennorrhœa in Women," *American Gynecological Journal.*

Dr. Jelks married, in 1870, Miss Susan E. Cook, of Culloden, Georgia. Their children are: Jane Margaret, Frank William, Julia Roberta, James Dawsey, and Susan Ellison Jelks.

He joined the Southern Surgical and Gynecological Association in 1888, and was present at the majority of the meetings thereafter. His papers were practical and showed a profundity of thought; his discussions were direct but always courteous. He was most highly esteemed by all who knew him, and his familiar form will be missed in the annual sessions. He died at Hot Springs in June, 1902.

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